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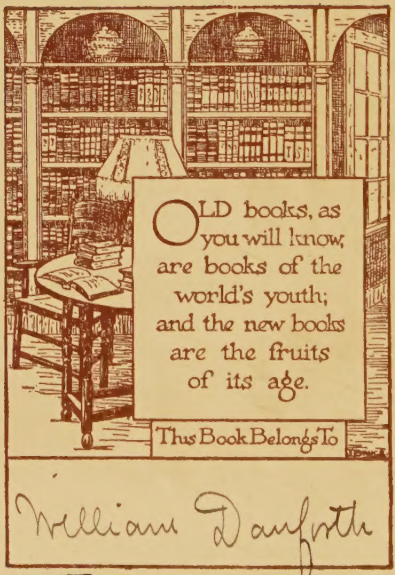
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TENNYSON'S MONUMENT.

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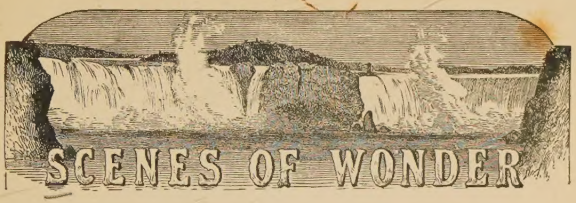

IN MANY LANDS:

BEING DESCRIPTIONS OF

REMARKABLE RAPIDS, CASCADES, WATERFALLS,
NATURAL BRIDGES, &c.

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"Rocks, torrents, gulfs, and shapes of giant size,
And glittering cliffs on cliffs and ramparts rise."
BEATTIE.

BOSTON: D. LOTHROP AND CO.;
DOVER, N. H.: G. T. DAY AND CO.

1870.

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PREFACE.

THE scenes described and illustrated in this little volume are all possessed of peculiarly interesting, not to say striking, and even imposing features; and on this, as well as other accounts, well deserve a place in our regards and affections. They suggest, with deep impressiveness, lofty thoughts of the Creator of all things; and they at the same time appeal, by a certain kindredness of mood and expression, to the deepest feelings of our own hearts. Nay, any interest they have is rooted in human sympathy, and we take them home to our bosoms, or stand aside, in their presence, with awe-struck wonder, according as they affect us with images of tenderness or fear, which all derive their spirit and life from the soul alone. Only as reflections of the soul's own moods do they possess any power to charm or appal, and it is

because those who have seen them and described them felt this—felt the likeness or unlikeness to themselves or others in them, a certain friendliness, that is, or foreignness of aspect—that they were seized with any desire to delineate them to others by pencil or pen. The brief sketches given in this volume are all derived more or less directly from eye-witnesses who had, consciously or unconsciously, this feeling; and it is from a kindred sympathy on our part they are attempted here. Some few of the places described have an additional significance, derived from their association with singular or sacred experiences in human history or life; and these, in one or two instances, supply an interest which is felt to transcend that which attaches to merely physical nature. If these sketches serve, in any degree, to introduce the places concerned and their related associations to the affections of the young readers for whom they are designed, the writer's labour will not be in vain.

J. W.

EDINBURGH, *October* 1867.

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SCENES OF WONDER

IN MANY LANDS.

I.

The Rapids of the St. Lawrence.

THE St. Lawrence, in North America, is connected with the largest continuous body of fresh water and the most extensive system of inland navigation in the world. The river proper—*i.e.*, from Lake Ontario downwards—is 750 miles long; which is increased threefold if we add to this the length of its lakes. Its breadth varies from 1 to 4 miles, and attains to 100 miles at its mouth; and it is, half-way up—*i.e.*, as far as Quebec—navigable for ships of 600 tons burden. The dry land portion of its basin is in area only thrice that of its united waters; and the volume of these waters is such that they would take forty years to flow over Niagara, at the rate of 1,000,000 cubic or solid feet in a second. Imagine a square pit a mile across and a mile deep: the quantity is

such that it would fill it 11,000 times;—a body of fresh water this, it has been calculated, nearly equal to that of all the other collections of this element on the face of the globe! The navigation it is capable of is interrupted for five months every year by frost, and at all seasons by rapids and cataracts: of which latter there are two—one in the channel by which the waters leave Lake Superior, and the other beyond their egress from Lake Erie, known to all the world as the Falls of Niagara; but the obstruction these offer has been so far overcome by the construction of numerous canals. The rapids—all except the great one which plunges over Niagara—are, by adroit management, navigable to certain species of craft descending them; but the journey upwards is always accomplished by means of the canals.

A rapid is a current, or rather torrent, of water, of such impetuosity that a boat cannot, unless under peculiar circumstances, breast and surmount it, and flowing over a bed of moderate slope, which is unbroken by a precipice or any solution of continuity, but more or less narrowed by rocks pressing down upon its margin or projecting from its bosom. The first cataract of the Nile is essentially a rapid; and this, as we shall see, is, under conditions, variously navigable, upwards as well as downwards. But most rapids are incapable of such manipulation; albeit there are few, however impetuous, which the natives cannot and do not, by dexterous and steady piloting, descend from above. This, as every one knows is

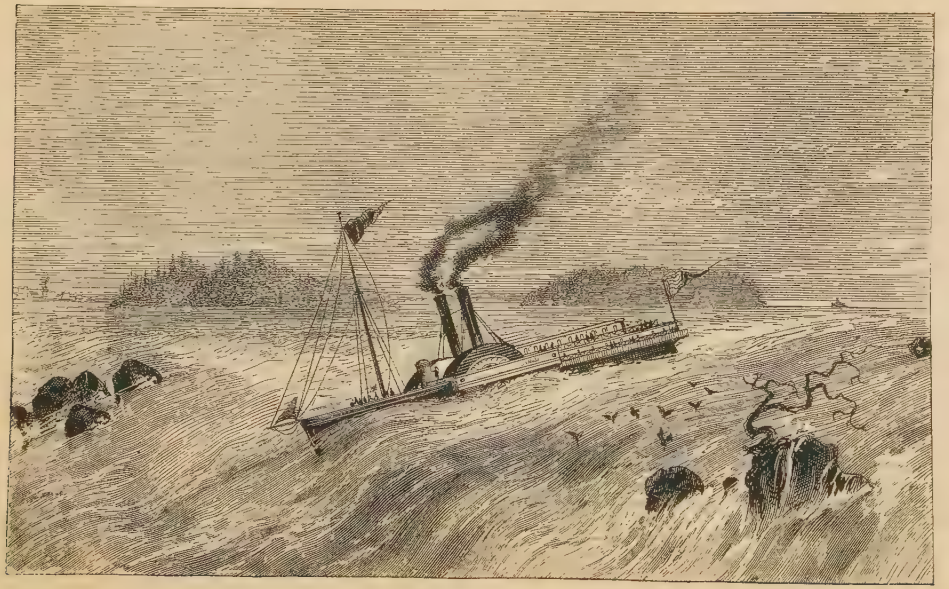
a feat the American Indians readily accomplish in their canoes of tree-bark; and the Creoles are daring enough to launch on these rapids a light and graceful craft, in which they dauntlessly brave and deftly shoot both the utmost rushing and eddying of the stream.

Rapids, though they are to be met with in greater numbers and on a grander scale in America than anywhere else, occur more or less on all rivers of any extent, if we except the large rivers of England, which show none throughout their course, unless in the tiniest form, near their springs. There are, for instance, to go no further than Europe, the rapids of the Rhine, at Bingen; those of the Rhone, at Pierre Encise; and those of the Danube, at Orsova. But it is to America we must turn for the grandest specimens; and not even there will we find anything to match, in respect of breadth and volume, the majestic rapids of the St. Lawrence.

These rapids are of varied character and extent, and occur chiefly in that region of the river which stretches between Lake Ontario and the city of Montreal. It is just below this lake the river proper commences; and here it is all at once broken up into a mazy infinitude of channels and lakelets by a world of islands, of all shapes, sizes, and appearances, which goes under the name of the Lake of the Thousand Isles. This is a phenomenon exhibited, except on a scale comparatively insignificant, by no other river on the globe; and the name it bears, though given

it before the fact was ascertained, does not the least express an exaggeration, for the islands were counted by the United States' Commissioners appointed to determine the boundary with Canada, and actually found to number 1692. To a craft threading its mazes this lake at times presents an ever-shifting variety of the most picturesque scenery, composed of innumerable elements of the most enchanting beauty, such as would in other days have not unworthily suggested the region of the Islands of the Blessed. These islands are fitly associated, in many cases, with romantic incident; and were in all probability at one time the scenes of many a Red Indian myth. One such in Lake Huron, they fable, the Great Spirit guards with tempests, wrecking therewith any one who dares to venture near it, lest by landing he should make worse shipwreck still. It was an island where gold abounded; and this the poor Red Indian believed to be a commodity the Great Spirit, in his fatherly concern for his children, deemed a possession fraught with greater evils to them than death.

But it is below the Lake of the Thousand Isles the rapids begin; and the first of these of any consequence is the Rapid of Long Sault. This extends, without break, for a distance of nine miles, and flows on at an average velocity of twenty miles an hour. It is divided in mid-channel by a long island, on the south side of which the current is narrower and swifter, and was for long thought safer



RAPIDS ON THE ST. LAWRENCE RIVER.

than on the north, a raft being able to shoot the entire rapid by this branch of it in forty minutes! Its surface throughout resembles the surging of the sea in a storm; and the roar of the waters, as in their headlong fury they roll onward, is awe-inspiring. The river steamboats, when they enter it—which they always do in their descent, often crowded with passengers too—have their steam instantly shut off, and descend it by the force of the stream alone. The rocking and plunging they undergo in their passage is such, however, as to impart sensations altogether novel, and unlike those experienced in a storm at sea; while the imminency of the danger the surging and roaring of the water suggest, creates an excitement under which the qualms of sea-sickness have, it seems, no place. It is an undertaking the conduct of which requires a steadiness and precision of pilotage which only unusual strength of nerve and long well-trained experience can insure; for if the boat should be allowed to turn, so as to present her side even in the least degree to the current, it would be instant and utter ruin, since the next wave would expose her broadside to the certain hazard of being capsized. The boat must be under the absolute command of her rudder; the rudder must obey the will of the steersman; and the steersman must be a man of the keenest, most decisive promptitude of both nerve and eye. The steersmanship in this case requires such strength of muscle, as well as swiftness of precision, that it is

usually committed to six men, all of whom sharply watch the movements of the master-pilot, and obey him as if each were in immediate contact with his will. The tiller—which is astern, and fitted on to the rudder to act as a lever—is managed by two of these men; and the wheel—which is in the foreship, and operative upon the rudder by means of chain and pulleys—is under the charge of the other four. What of faculty these men possess is, for the time the passage lasts, in a state of utmost tension; and all on board strain along with them with a sympathy which in their ear and Heaven's amounts to prayer. It is an excitement in which all share; the grander and nobler, the more it for the time raises the soul above all fear.

There is a series of rapids, several miles in extent, and terminating where the Ottawa mingles its waters with those of the St. Lawrence. These go under the names successively of the Coteau Rapid, the Cedars, the Split Rock, and the Cascades; and the passage of these is effected similarly, and is as exciting as that of Long Sault. The waters in these rapids descend, however, more over a succession of ledges, which here form the bed of the river, and the vessel is every now and then "settling down," when she has passed from one ledge to glide over another. At one point in the rapid of Split Rock a fearful sensation is experienced, for it seems as if the vessel were being driven helplessly upon a rock, where she is sure to be dashed in pieces; but just

when it appears as though you already heard the teeth of the rock crunching her timbers to atoms, she is suddenly piloted past it, and clear of all danger.

Immediately above Montreal occur the last series of rapids on the St. Lawrence; and these are nine miles in extent, and have for two centuries borne the name of the Rapids of La Chine, because, when first discovered, it is said they were hailed by the *voyageur* as a new route to China! They are as swift and wild as the others; and, to avoid them, the people of Montreal have, at great expense, cut a canal alongside of them, of such proportions as to reflect the highest honour on the spirit which conceived and carried it through. This, however, like the rest, is used by the mail steamboats, at any rate, only in their ascent; for these—which are of a size, moreover, to draw seven feet of water—descend the river with goods and passengers from Lake Ontario all the way to Montreal, without passing through a single lock, and accomplish the journey between the sunrise and sunset of a single day—a distance equal to about two hundred miles.

II.

The Cascades of the Hoar-Frost River.

THIS "turbulent and unfriendly" river falls into the north-eastern extremity of the Great Slave Lake, and appears to begin its mad career somewhere in the latitude of the southern coasts of Iceland, at a point nearly half-way between the shores of Hudson's Bay and the banks of the Mackenzie. It is distinguished among rivers for being throughout its course nearly one unbroken succession of bounding cataract or foaming torrent; and it seems to owe the name it bears to the "hoar-frost" appearance which either mantles its rapids or overhangs its cascades. It became known to geographers about 1833, being then discovered and traversed by an exploring party under Captain Back, who had in the summer of that year been sent out from England in quest of the Arctic voyager, Sir John Ross, then amissing. Back and his party, who were navigating the lake in search of a northern outlet, first caught sight of it at the head of a small bay trending northward, and bending off from

a larger stretching south-east. Its apparition was altogether unexpected by the explorers, as in the evening they let their craft drift uncertainly eastward. When they saw it, however, they at once recognized it as the outlet northward they were in search of, and which their Indian guides had assured them they would find. Nothing doubting, therefore, they turned in, sure that the opening they had reached was the one they sought for, though there was not one who did not feel appalled at the prospect of surmounting the cataracts, to escape beyond. There, as they rowed up, rose on the left, reaching backward, tier upon tier of broken, steep, barren rocks; to the right, a deep shelving bank, sloping upward, and covered with a jungle of stunted fir-trees; while between came dashing down, from a height of sixty feet, into the dark gulf below, two roaring cataracts, dimly veiled in clouds of misty spray. To the merely "picturesque tourist," it were a spectacle simply entrancing; but to the party that first descried it, it was suggestive only of further perils and harder toils, there as it stood, stern as any sphinx-goddess, ready to devour the inquirer who could not, except by resolving her riddle, escape her power. The very Indians dared not venture to penetrate its banks, except with only bow and arrow; for there, as our adventurers paddled up, lay, concealed in the thickets at the bottom, fifteen or twenty small canoes, waiting the return of their owners from the hunting-grounds beyond. But

Captain Back and his company had to scale its steep and rocky sides through unknown entanglements and to unknown lengths, not only with food and equipments sufficient for an uncertain journey, but they must carry or tug along with them a fully armed canoe, for the rivers and lakes they knew they had still to traverse.

Not till the morning after their arrival in the bay was the ascent begun in earnest; but this, when they did begin it, they essayed with all the spirit and energy of men who felt that success depended upon each doing his utmost, and, as it were, all. The difficulty of the ascent was great from the very outset; and it seemed they would never be able to land the canoe on the first ridge at the level of the crest of the cataract, such was the unevenness and slipperiness of the slope, and so thickly intertangled were the twigs and branches of the trees and underwood. This ridge, when they reached it, they found to consist of sand, and the *débris* of red feldspar and quartz from the surrounding rocks; while beyond extended a level of mere swamp, overlooked by another ridge and a second waterfall. When they surmounted this, however, matters looked more hopeful; for here the waters had collected into a pool, in which they joyfully launched the canoe, in hope, at least, of some little respite. But hardly had they, in their paddling, accomplished a few hundred yards, when, lo! in front of them rose fresh clouds of spray from another and another waterfall, both thundering

down as impetuously as their twin sisters at the bottom. These, for peril of their lives, they durst not approach, except at a distance; so the canoe had

CASCADES ON THE HOAR-FROST RIVER.

to be again rowed ashore, and borne away to the next landing, and thereafter along the steep and sloping banks of the river. This, too, on ac-

count of the jungle, the rivulets, and quagmires, was no easy enterprise; but it was accomplished, and a landing effected in a space, still with steep and towering heights in front of them, but now free from intricacy and bog. "It was barren and desolate," says Captain Back. "Crag was piled on crag, to a height of two thousand feet from the base; and the course of the contracted river, now far beneath, was marked by an uninterrupted line of foam. After frequent halts to recover breath, the summit of the difficult pass was attained; the blue lake we had left lay as if spread at our feet; and such was the beauty of the varied outline that we were captivated into a momentary forgetfulness of our fatigue." The descent from this point to the river was at first gradual, he adds, for the path lay over rocks, which, though water-rounded at the edges, were smooth and even a-top. But by-and-by, it seems, moss-covered swamps intervened, and finally a bank of *débris*, sloping down to the river's brink so precipitously that Captain Back, though with no other incumbrance than his cloak and gun, could with difficulty save himself from falling as the loose masses slid away from under his feet. The boat with its burdens was notwithstanding securely launched again; and all now breathed more lightly, comforting themselves as best they could with the hope that the worst was past. The river at this point, though still rapid, was smooth—nay, glassy-surfaced, and could be traced for three miles ahead

flowing down from the north-north-east. "It was bounded on each side by steep shelving rocks, cheerful with vegetation, and thinly clad with birch, firs, and willows." Here the party, being wearied, halted, and choosing a level spot on the opposite side, pitched their tent and rested for the night. The labour hitherto had been aggravated by the incessant attacks of myriads of sand-flies and mosquitoes; and the travellers, as they now turned into their quarters, were stung all over the body, and swollen, and blood-smeared over the face. "No form of wretchedness," says Captain Back, "among those to which a *voyageur* is exposed, is at once so great and humiliating as the torture inflicted by these puny blood-suckers. To avoid them is impossible; and as for defending himself, though for a time he may go on crushing by thousands, he cannot long maintain the unequal conflict: so that at last, subdued by pain and fatigue, he throws himself in despair with his face to the earth, and, half-suffocated in his blanket, groans away a few hours of sleepless rest."

By 4 A.M., therefore, our explorers were astir again, and off and away, in the hope of before sundown overcoming all the difficulties of this unfriendly river. Of these it appears there were still plenty in store for them; as they had not gone far when they came first upon one rapid, and then another and another: so that the best part of the morning was spent in unlading and relading the canoe, and

dragging it, now with its cargo, and now without, by means of a rope. By-and-by there stood confronting them another cascade, foaming noisily from a height of twenty feet; and this, like the rest, it was possible to surmount only by the slow toilsome carriage of both boat and baggage up hill. "This passed, other rapids presented themselves; until, finally, the canoe got so seriously damaged by the shocks, as to make us hasten on shore to avoid sinking." At this point Captain Back's interpreter fell dangerously ill; and he passionately implored the captain to heal him, with a tone clearly signifying his belief that he could, if he would. The captain, being pressed, complied, and proceeded to administer the contents of a pill-box—which, being an over-dose, made the poor sufferer worse; but the contents of a brandy bottle being next administered, not only counter-wrought the pill medicine, but made him better, and quickly set him on his feet.

In a little the canoe was repaired, and the interpreter himself again; but it was only to wrestle with further difficulties remaining to be overcome. The stream beyond began to be studded more and more densely with sharp angular rocks, between which, as the slope was considerable, the waters rushed oftentimes with a "force that almost swept the hauling men off their legs." It was the roughest piece of navigation the poor craft had had to face; and when it was finished, there, towering in front, rose, wildly defiant, another cataract, forty-five

feet in height, consisting of three distinct falls, ascending backwards, like the huge steps of a stair. Again must every man address himself to the work of carrying, and each do his best to encourage his neighbour with hope: and they had reason, for some were sufficiently enfeebled in body, and all, though they spoke words of cheer, were faint enough at heart. Happily, this was their last formidable labour; for "one or two more rapids, and a narrow fall of twenty feet, terminated the ascent of this wild and wilful river."

Thus did the task of ascending it occupy Captain Back and his party two entire days, working overtime; and in the course of them they succeeded in toiling their way over no fewer than eleven or twelve waterfalls, and a succession of rapids, hardly interrupted, and without number.

III.

The First Cataract of the Nile.

THE Nile, like the Jordan, is one of the sacred rivers of the earth. By its depositions of soil, brought down in its annual overflowings, from immemorial time, for century after century, chiefly from the mountains of Abyssinia, it has made and maintained the whole land of Egypt; and this land, in a very literal sense the daughter of the Nile, "the Genius of the Waters," as the Egyptians call it, is the early cradle of the religion, wisdom, and science of the Western World, the birth-place of its history, both sacred and profane. Issuing, as it is now known, from Lake Victoria Nyanza, at a point one-third of a degree north of the line, by a stream 150 yards wide, over igneous rocks 20 feet high, called the Ripon Falls, it goes on winding and receiving affluent after affluent to augment its volume, until midway down its course—that is, 1500 miles from its mouths at the Delta—it moves on majestically alone, like the god and father the Egyptians have from the earliest times regarded it, unaided henceforth by a single

rivulet or rill. In this part of its course, though its waters are, in the total absence of rain, drawn off to irrigate the whole length of the land, it maintains, where its bed is not narrowed by cliffs pressing upon it, or widened by islands of rock or sand in the middle, an average breadth of more than half a mile; and this volume of water, which is deep and powerful as well as broad, and even when divided into two is as imposing as the Rhine in its majestic moments, comes all down from regions far within the tropics, where it is understood it rains, mostly in torrents too, for above 200 of the 365 days in the year. The annual inundations, however, which have formed and are still forming the land of Egypt, at the rate of six inches of new depth of soil in a century, are due entirely to rains that fall periodically in the mountains of Abyssinia; and these inundations, as from the first so still, begin about the 25th of June, continue increasing for three months, and after twelve days, during which they remain stationary, subside again, leaving the ground prepared for the sower and the husbandman. On this the life of Egypt to this hour depends: too little overflow any year is dearth and famine throughout its borders; and too much, plague and pestilence to man and beast.

From Assouan, where, at its descent over the first cataract, 700 miles from its mouths, it enters Egypt from Nubia, the ancient Æthiopia, the Nile flows on evenly by an average fall of three inches in a mile, and

at the average rate of three miles an hour, in a stream of an increasingly rich dark brown or olive colour, and between banks composed of the deposit of the river, of the complexion of chocolate. The long, narrow, isolated valley, from Assouan downwards, which it traverses, waters, and fertilizes, is bounded all the way by two, now approaching, now receding ranges of sandstone or limestone hills, frontiers of mere desert wastes lying far and wide beyond; and between these, for the most part contracted enough, to zero sometimes, in two broken strips of emerald, which at the harvest become golden, and at the overflow silvern, lies a land which, for independent fertility of resources and the awful despotism of its ideas and idols waxing blasphemous, is without a parallel under the sun. Sunk to-day, so far as its life and influence on history are concerned, it has all its original fertility, and yields for most part three harvests in the year, and dates in clusters without number. The waters too, which are delicious to the taste, swarm with fish of endless variety; while the atmosphere and sky overhead inspire a luxury of sensations which strangely, in this land of oppressions, buoy the soul aloft into a soft world of azure and upper light.

For 700 miles from its mouths, the river is, during the Etesian or north wind, easily ascended, not the shadow of a rapid to contend for once with, all the way. Only at Assouan—the ancient Syene—on the utmost border, a little below the first of its six

cataracts, is it first seen to whirl and eddy, sounding over its bed in "a low monotone." Here the river for the first time exhibits features which might be called romantic; here it has its broad, majestic bosom, grandly guarded by sandstone cliffs, of which the eastern is picturesquely surmounted by the ruins of a Saracenic castle, and the western no less so by the ruins of a Christian monastery. It is the intimation of a transition to a totally different country and race of people. Here the Nile Valley has its continuity broken, and its bed is crossed by a range, which serrates the horizon southward, of red granite, called syenite, with black porphyry intermingled, stretching eastward, it is understood, as far as the Red Sea, and then bending northwards to bound its western shores. Over the northern face of this granite bulwark the waters rush expanded, breaking in foam upon a multitude of dark, high-towering, fantastically-fashioned rocky masses, which here, both within the bed and beyond it, lie everywhere scattered about. This is the first cataract: the second, which is wilder every way, and of the nature of a rapid 10 miles in extent, is 150 miles higher up. The inroads of the desert sand on the Nile margin here are very noticeable. This sand has thrown itself up, under the action of tempests and hurricanes, into wild, billowy, fantastic mounds, of a pale, death-like hue; and only the blue river in its majestic march, a few of the islets in the mid-channel waving with palm-trees and yellow with corn, and the nearly naked fishermen

paddling the waters, with the wild duck and the heron flying over them, remind you that you are not beyond the verge of life. It is a waste, on all sides, of tomb- or temple-fragments and rugged rock quarries, whence, in ancient times, the Egyptians quarried their obelisks and gigantic statues, and obtained, Dean Stanley surmises, the models also after which they made them.

The cataract, hazardous as the navigation of it looks, and is, may be faced and safely surmounted under a steady north wind, and a firm, skilful, and experienced pilot, especially when the Nile is rising and the risk of bumping and wrecking on the rocks is less than when the water is low. This enterprise has been and is repeatedly attempted with success; and our illustration shows how at a particular crisis the affair is managed. A captain of the due capacity and nerve in steersmanship is hired on the spot, under whom your own crew and the half-naked subordinates he brings along with him move at his bidding as mere automata, to shift the sails, spring ashore, or plunge into the rapids, as he may require them. "A tall, dignified ebony statue, in a long blue robe and white turban," perhaps,—there he stands, steady at his post, with an air, look, and voice all-commanding. His eye, as he enters the rapid, glances quickly from rock to rock; one of his men, at the prow, watches the shifting eddies; he himself notes all the signs, and with a voice of thunder issues his commands, which are obeyed by his men quick as

FIRST CATARACT OF THE NILE.

lightning. It is beautiful and grand to see, and an epitome of true captaincy and hero-generalship all over the world—the man with the eye and nerve authoritatively commanding, and a crew, full of loyalty, doing instinctively and instantly as he requires, knowing this to be life, and believing in a better knowledge, wisdom, and steersmanship than their own. As in life, so is it at this first cataract of the Nile—straining under her canvas, your craft is bearing down upon a rock to instant ruin; but your captain, seeing it, issues his orders, and you drift gently on a harmless shoal of sand. Henceforth you too acquire confidence in the pilot, and you forget all the danger in the excitement that supervenes. Onward you go, advancing by an irregular zig-zag movement to avoid the rocks and eddies, until at length, near the top, a louder and more violent rush of the torrent aggravates the peril, and the Nubians dash into the stream, make for the rocks, and begin with loud shouts to haul at the tow-rope. At such a crisis all the men, except the steersman, will quit the boat and bear a hand at the pulling, and not rest till, amid a chorus of noise and yelling, they have made it shoot the rapid into the calm glassy waters above, "the rocks around echoing with the shouts and laughter of the naked and steaming Nubians, like so many animated statues formed out of the black basalt crags around." And now in front of you, seen reflected in the mirror-like face of the water, with its palm-groves and its ruined temples, starts into view

the sacred island of Philæ, the whole like a fairy scene conjured up by enchantment.

This cataract, under less favourable circumstances, is sometimes ascended by the boatmen, fifty in number perhaps, tugging and pushing the whole way, some on the banks or rocks, some on the craft itself, and others plunging hither and thither to the rescue in the surging waters. It is an animated spectacle; only the roar of the cataract is too feeble to drown the hideous cries of the boatmen. These fellows, who are for most part tall, slender, and lithesome, are brought up from boyhood—six years of age, it is said—to steer their way alone athwart, before, and against this troubled element. Stripping themselves naked and bundling the garments on their heads, they dash, from this early age, into the rapid, balanced astride on a small log of palm-tree wood five feet long, one and a half in girth, and flattened at the upper extremity, and dart with a swift dexterity across or against the current, sitting sometimes erect, sometimes with their legs and sometimes with their whole body extended along the float, paddling and steering their way by their hands alone. These, when they grow up, will take to fishing in this fashion, with a dirk slung from their shoulder; and when so occupied they are often seen coolly and carelessly puffing a pipe! Such, and so adventurous, are the men this "Captain of the Cataracts" has under him; trained thus loyally to such masterhood in this element, of which he is the king.

IV.

Petrified Cascade of Pambuk-Kalessi.

THIS unique cascade is situated in Asia Minor, in the latitude of Athens, 220 miles nearly due south of Constantinople, and about 130 miles south-east of Smyrna. Immediately behind and above it stand, conspicuous from a distance, the ruins of Hierapolis; while five miles to the south of it is the site of Laodicea; and about as far to the south-east that of Colosse. It overlooks a plain to the south of it, which sweeps westward, and which is traversed by the river Lycus, a tributary of the Meander; and it is itself overlooked by the summits of the mountains, which insert themselves between it and the south-westward course of the Meander to the north. Seen from Laodicea, it presents the appearance of a chalk cliff; but, near at hand, so striking is its aspect that an eye-witness declares, any description, if only faintly true, would seem to most to be simply romantic. The seeming chalk cliff here unfolds itself into a stupendous mass of stalactite, or alabaster, which is literally nothing

else than "an immense frozen cascade, the surface wavy, as of water at once fixed, or in its headlong course suddenly petrified." This—as its contour at the very first glance proves—has been formed in the course of ages by the constant fall of water charged with mineral; which, as it descended, left ever and anon particle after particle of the mineral adhering to the brink, until at length a series of something like icicles were formed; which, by lengthening, thickening, and uniting, gradually took the shape and figure it now so surprisingly wears.

The waters still flow on here and there in rills, or trickle over it, and give it, where they moisten it, an appearance like salt, or snow, when melting. They are clear, soft, and warm; and the caloric and mineral with which they are charged they bring with them from the depths of the limestone hills behind. The mineral matter contained in them is tasteless and inodorous, and, being alkaline, ferments with acids; but it is solely in consequence of the heat in the waters a deposit results; and this heat is due to these waters passing somewhere, at very likely no great distance underground, over rocks that are kept burning hot by the vicinity of the central fires of the earth. These fires—which, as the lava at its ejection from volcanoes testifies, are intense to a degree often passing all belief—are known to cause the rocks, in many cases hardly two miles from the surface, to be of a temperature equal to the boiling point of water; and hence, if, by means of

fissures in the Earth's crust, the water deposited on its surface from the atmosphere penetrates in any

PETRIFIED CASCADE OF PAMBUK-KALESSI.

case to this level, it is both set a boiling and sent by its great specific levity to the top, where it issues at a temperature more or less elevated, bearing in it

more of the mineral dissolved in it than it can retain when it cools. This is the explanation of all thermal or hot springs over the world, and the theory which accounts for all the phenomena of this cascade. What the heat of the water in this case is we are not informed: but there is a fountain in North America, near the chief city of the Mormons, mineralized with sulphur, and believed by the saints to be of virtue equal to the Jordan, which, where it issues to the light, possesses a temperature sufficient to boil an egg; and in the geysers of Iceland we have the water, at a very little depth from the surface, above even the boiling point itself.

The water of Pambuk-Kalessi, though undrinkable, and even deadly—as the army of Tamerlane the Tartar knew, it seems, once upon a time, to its sorrow and cost—issues at a temperature equal to that of a hot bath, and is such as to have, in antiquity, created round it a city sacred to the worship of the nourishing and healing Earth. This was Hierapolis —*i.e.*, "sacred city;" and of this, these hot baths were doubtless at first, and for long, the chief attraction. The ruins of this city, which are conspicuous at a distance above the cascade, consist of pillars, arches, vaults, piles of various structure, &c., which, owing to earthquakes—once prevalent, and occasionally occurring still, in this region—have fallen either entirely over or off the perpendicular. They cover an area of a mile in length by 200 paces in width, and contain the wrecks of temples, baths,

and gymnasia, and the remains of a theatre, "the least dilapidated," says Chandler, "of any I have seen." Outside the city is a cemetery, with its sepulchral monuments, desolate and waste enough; while all round, and below the cascade as well as above, are patches of what were once gardens or orchards, of which the fences were formed by ingeniously causing the incrusting waters to flow round them, which, as they deposited the mineral, gradually formed walls. Hierapolis, though now deserted, and far apart from the highway of the world to-day, was, as well as Laodicea and Colosse, once a place of great resort, not only for its baths, but also for its trade, its manufactures even, and its temple. It lay at one time on the route between Babylon and the West, and was a halting-place for the caravans. Its waters, too, had a virtue good for dyeing; and it is said that by their means a vegetable extract could be made to yield a dye that simulated even the Tyrian purple. But the temple and worship appear to have been the original and prime attraction; and these were of such repute that they continued to flourish in splendour for five hundred years after the commencement of the Christian era. The temple was dedicated to Cybele, the mountain-throned earth-mother of the gods and heroes; and her worship, which was associated with that of Bacchus, was of a wild, enthusiastic character, expressing itself in excited, cymbal-accompanied dance and song. Apollo, as the god of health—*i.e.*, god

under whose inspiration men were whole and well—was tutelary or guardian divinity of the place; and he, with Æsculapius his son, and Hygeia, both healers, had the name of it inscribed on their coins, as a place, probably from the supposed medicinal quality of its waters, sacred to health. On one of the walls of the temple Chandler is in such raptures with, is an inscription which, when rendered, runs thus:—"Hail, golden city, Hierapolis! the spot to be preferred before any in wide Asia—revered for the rills of the nymphs, adorned with splendour!" The city is at the present day without inhabitant; and the country, being for ages past in anarchy, is a prey on all hands to banditti, and save a few Turcoman huts, poorly fenced and provided, there is hardly a habitation visible for miles round. Parties occasionally resort to it, indeed, to bathe in the waters; and now and then may be seen the solitary figure of a female washing linen in them, with, mayhap, an infant strapped to her back. But the whole region is waste and barbarous, and no man's life or property is safe. It was far otherwise in ancient times, when it was peopled with colonies from Greece; and the natives, though reputed indolent and stupid, did, in their mystic rites and excitable temperament, worship divinities who, they supposed, would only favour such as honoured them by improving their gifts, as in the cultivation of the fruits of the earth. Barbarossa, too, marching this way in 1090 with an army bound for the Crusades, found the people then so orderly and

kindly, that at parting he openly invoked a blessing from God upon the land—openly and earnestly, with his eye on heaven, and on his bended knees. The wealth of the temple at one time was such that it took Crœsus, who plundered it, days to examine and weigh all its treasures!

The modern name, Pambuk-Kalessi, means—"Pambuk," *cotton*, and "Kalessi," *fortress;* and it was given to it because, it seems, at a certain distance, the cascade resembles an immense pile of cotton, and the ruins behind, a castle on the top. Thermal waters, similarly impregnated to those which have formed this cascade, must have emerged, in ancient times, in neighbouring localities; for Herodotus describes a species of tunnel as existing at Colosse in his day, under which the waters of the Lycus flowed onward for half a mile from the town. This tunnel, modern travellers tell us, has long since fallen in; but the edges may be still traced, and so the fact which the historian relates cannot be doubted. It had been formed in the same way as the cascade, and must have collapsed under the earthquake shocks to which this whole region was in early times subject.

We shall mention only one other wonder for which this district was famous in antiquity, and it existed, if it do not still, near Hierapolis itself. This was a fenced-in place, communicating by a narrow aperture, wide enough to admit only one person, with a mountain cavern of great depth, from which issued

continually a vapour of such deadly quality that it was instant death to any man or animal who entered and breathed it. It was called the Plutonium, and was said to be fatal to all except Pluto's priests: only they, as dedicated to Pluto, could inhale its vapours and live. These priests were the priests of Cybele as well, and always, in the religion of the Greeks, an intimate connection is observed to subsist between things on the earth and things under it, and the worship of the divinity of the one was more or less associated with that of the divinity of the other.

V.

The Falls of Trolhetta.

THESE falls, existing in the upper course of the river Göta, in Sweden, are in respect of volume greater than, and in respect of grandeur of effect equal to, any in Europe. The Göta, part of the course of which they form, issues from the south-western corner of Lake Wener, of which, though it receives no fewer than twenty-four rivers, it is the only outlet; and after flowing for fifty or sixty miles in a direction in the main a little to the west of south, falls, by two mouths some miles apart, into the Cattegat, nearly straight east of the Skaw, in Denmark. The falls excepted, it is one of the calmest, most smoothly-gliding rivers in the world, whether, as is the case, it spreads itself into a shallow a mile wide, or contracts into a stream of only one or two hundred yards; and its banks present every variety of scenery—now waste and dreary, now grand and elevating, and now beautiful and charming. From the lake where it emerges, to the falls—a distance of five or six miles—the

aspect of the country is bare and bleak; nothing all round but expanses of barren heath and ridges of rock, which are almost, if not altogether destitute of vegetation. The river itself, however, in this part of its course, is not without interesting features; for the stream is prettily studded here and there with islands, which, though in some cases mere rugged masses of naked rock, are not unfrequently also tufted with wood and covered with soil fit for the sower.

At the southern extremity of this section of the river, two ranges of mountains are seen to run parallel with its banks, and by-and-by approach them till they come down upon the edge of the stream, and at length confine it within a channel only 400 feet broad. Here it is as smooth and noiseless as in the upper expanses, and to the eye nearly as still as an untroubled lakelet. This smoothness continues to the very brink of a precipice athwart the channel, which the stream all at once bounds over, in a broad, still, glassy-surfaced sheet of water, to be broken at length by out-jutting rocks, and fall with uproar into a wild, seething, steaming abyss below. This is the first of the cataracts of Trolhetta, which extend, broken only by intervening eddying rapids, to the distance of nearly a mile below. The bed of the river here has been worn, in the course of ages, through the solid rock by the constant friction of the current; the banks, which overhang it, are nearly perpendicular; and at the beginning of the

fall the stream is broken and narrowed still more by the interposition of several granite islands, thinly strewed with brushwood and stunted pines, forming

THE FIRST CATARACT OF TROLHETTA.

small straits, down which the water dashes wilder and wilder. The scenery round, and for twelve miles onward, is of the quality called romantic, or grandly impressive; the mountains, which include

the valley, and even at times press upon the banks, being clothed with dark, dense, primeval forests, the pines of which dip their roots in the stream and wave their branches on the highest summits. A road, too, winds picturesquely all the way along the banks; now skirting the water's edge, and now rising steep up the sides of the mountain, from which are visible the far-off reaches of the river, and ships wending to and fro amid the trees over its peaceful bosom. Clearings there are here and there in the woods, cultivated into broad lawns and blooming orchards, each embosoming some stately mansion or tasteful villa, and all contrasting beautifully with the sombre tints and frowning heights around.

The falls themselves are four in number, and separately of no great height. The largest, though it seems lower, is said to approach 60 feet; and the fall of the four together does not exceed 130 feet. But the environment, the volume of water, the stillness of the current above and below, and the perceptible quaking of the rocks in their neighbourhood caused by the falls, contribute to render them as impressive as any, even the largest, cataracts in the world. The impression upon the mind, particularly in calm weather, and still more by moonlight than by daylight, is so unique that you linger under it, and are ever after equally unable both to forget it yourself and render account of it to another. The effect on the mind is akin to that produced by Niagara itself—which is such, that you can by no

art of speech, at all events, make your reader apprehend the impressions or experience the emotions felt by you when you actually beheld it. "It is not a *fall*, but a torrent, or rather a mighty river, chafing, in a broad bright ridge of foam, for more than three-fourths of a mile, with deafening noise, down the side of a mountain; now gushing in one body over a perpendicular ledge, then breaking for a short space through fragments of rock, till it reaches another brink, and so from fall to fall, till it sinks into the valley, where it is in one moment as smooth as if it had never been ruffled." It is thus Bremner, who visited it, doing his utmost, apparently, and with all the wish in the world to impart his emotions to his readers, attempts to convey his idea of these cataracts. But "these cold words," he adds, "excite not a spark of the overwhelming emotions the spectator feels, as he hears the roar of the torrent and feels the solid rock shaking beneath him; as he sees the waters now rushing with fury from the brink of the ledge, and the next moment boiling tumultuously in the vast whirlpool at its base; as he tracks those white and sportive masses of spray filling the whole valley, and equally beautiful whether they rise, as when he first saw them, like vapoury clouds in the twilight gloom, or sparkle, as when he next beheld them, like drops of gold in the sun" An old geographer, writing of the falls from rumour, startles his readers with this description: "A few leagues from Gottenburg," he says, "there is a hideous

precipice, down which a dreadful cataract of water rushes with such impetuosity from the height into so deep a bed of water, that large masts and other bodies of timber precipitated down it disappear, some for half an hour, and others for an hour, before they are recovered. The bottom of this bed has never been found, though sounded by lines of several hundred fathoms"!!

Stupendous as they are, they however verge by no means so closely on the bottomless as old Guthrie, in his not unbecoming sense of the mysterious, here describes them; for did not an engineer once actually dare, not only to project a canal, by a succession of locks, down these precipices, but, by diversion of the water and drying up of the channel, to put his scheme in operation, and carry it on, with deflections, beyond the third fall? Nor was it because the abyss yawned upon him that the projector desisted, but because he miscalculated the strain upon his water-dams; for these, under the pressure of the water, of a sudden yielded, so that the stream, sweeping wildly downward, wrecked in one fatal moment the labours and expense of years. It was an enterprise which had occupied the thought and heart of Sweden for generations, and a scheme fostered and furthered by all the people, from the highest to the humblest ranks, the accomplishment of which was the removal of the only difficulty to the realization of a project dear to all of them—the union, namely, of the Baltic with the German Ocean, and the opening up of a trading

channel independent of the route by Denmark and the Sound. Its failure, therefore, at this time was regarded by all as a national disappointment and disaster, the more so that the efforts made to achieve it, through these barriers of granite, were Herculean; and so bitter was the feeling among them which accompanied the recollection of its defeat, that it was for long and generally believed the insufficiency of the works, which led to the ruin of the enterprise, was due to bribes given the contractors by the jealous Danes! The brave Swede, however, soon recovered from his mortification, and ere long renewed the endeavour; and at length, after years of labour, and an expenditure of means we may call enormous, the work was brought to a successful and happy issue in the year 1800. English Telford had the honour of guiding the enterprise, by his engineering faculty, through its last stages; and it was under English superintendents that Telford's ideas were carried out.

Thus, side by side with these stupendous falls, there rises as colossal an undertaking as was ever consummated by the cool ingenuity and daring enterprise of man. It consists of a series of locks and sluices, cut mostly through the solid rock, along which vessels of considerable burden ascend or descend at all hours of the day. An idea of the vastness of these works and the steepness of the ascent, as well as the inclination of the bed of the falls they are constructed to surmount, may be inferred from

the fact, that within the first eight hundred yards, reckoned from the bottom, as many as fourteen locks are visible, nearly at a glance, to the spectator standing below—"a huge breast-work of most beautiful masonry, tier rising on tier, like the steps of a gigantic stair." Whether these contribute to enhance the picturesqueness of the scenery above and around them is a question; but surely the impressiveness of the moral lesson they teach man far outweighs all considerations of the merely grand and imposing in rock and waterfall.

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VI.

The Fall of the Staubbach.

THE Staubbach is universally reputed to be the highest waterfall in Europe, worth the name, descending, as it does, a perpendicular height of between eight and nine hundred feet—an altitude equal in elevation to that of Arthur Seat, near Edinburgh, above the level of the sea. It is one of thirty existing in the deep, narrow Valley of Lauterbrunnen—*i.e.*, "Valley of no end of fountains"—which extends southward from the eastern extremity of Lake Thun in Switzerland. From Berne to Thun, the distance in a south-easterly direction is sixteen miles; from Thun along the northern margin of the lake to Unterseen, on the east, is ten miles more; and from Unterseen up the valley to the Staubbach is an incline of seven miles, or a walk of two hours and a half. The road up the valley skirts at its commencement, on the right, an old square turret-flanked ruin, called the Castle of Unspunnen, and celebrated as the residence of Byron's Manfred, and about two miles from the

lake forks into two; the branch on the left making for the Magic Peak of the Wetterhorn, seen at the crossing; and that on the right leading direct to the village of Lauterbrunnen and the falls, and offering in the distant vista gleams of the stainless Jungfrau. The forking of the road here represents a forking in the valley, of which the one on the left is traversed by a stream called the Black Lütchine, and that on the right by another, which goes to join it, called the White. The Valley of Lauterbrunnen, on the right, is steep as well as narrow, and closed in on both sides by nearly perpendicular limestone precipices, resembling walls, from the brows of which the streamlets we have mentioned are seen here and there floating downwards, like hanging, waving bands, woven as it were of silver. These cliffs are often of great height, and exhibit in one instance very singular contortions in the limestone strata.

The village itself, seen on the left of our view of the fall, and nearly half a mile distant, is a confusion of mostly rude dwellings on both sides of the stream, which the Staubbach contributes to augment. It contains about 1500 inhabitants, and is nearly 2500 feet above the sea;—a cold region on the whole, with a climate unfavourable to the finer cereals and orchard fruits, and so closely pressed upon by shading precipices as to have no sun in summer before seven o'clock, or in winter before noon. The Staubbach, which is the largest and most remarkable, as well as loftiest of the streams, that, at one time in in-

FALL OF THE STAUBBACH.

creased, at another in diminished numbers, find their way as silvery cascades over the cliffs, is not to eye or ear an imposing spectacle, so far at any rate as to impress the beholder with a sense of vastness or force. The body of water is at the best by no means enormous; and soon the whole is in its descent dashed noiselessly, by the mere resistance of the opposing air, into spray, and erelong into a fine mist-like rain. It is this powdery appearance it has at all times that at first suggested its name; for Staubbach means literally "dust-burn" or torrent which descends in dust. The impression it makes varies with its own mood and that of the spectator. Byron likens it, in its wavy curvings, to the tail of a white horse streaming in the wind. "It is neither mist nor water," he says, "but a something between both; its immense height gives it a wave or curve—a spreading here, or condensation there—wonderful and indescribable." A waterfall one-third the height, north-east of Moffat, in Dumfries-shire, suggests a similar comparison to the Scottish peasant; but he, with a humour which beseems the countryman of Robert Burns, designates it in homely fashion the Grey Mare's Tail.

Seen from the front, the Staubbach often presents the appearance of a white semi-transparent lace veil, flitting to and fro over the face of the rock, and contracting itself now and then into folds and undulations as of drapery. The occurrence of this aspect, however, depends much on the quantity of water

being such as to project it sufficiently forward from the rock, and the condition of the atmosphere in respect of stillness; and, indeed, so volatile a phenomenon is liable to be quite changed and upset by an infinitude of circumstances—just as the centre of the earth, too, is by the casting of a stone or the rocking of a cradle. The Staubbach, however, for most part reveals its glory just when the sun is nearing the meridian; that is, a little before noon. At this particular time more especially a rainbow gilds it, which, with the snowy whiteness of the spray, is all the more impressive from the shadow of the water on the face of the rock: and so here, as everywhere, the depth of the shadow enhances the glory of the sunshine, perception itself being possible only in virtue of the circumambient void. When mists or clouds envelop the brow of the precipice, the effect on the mind is very singular; for then the waters appear, like Minerva from the brain of Jupiter, to leap ready formed direct from the sky. It was this aspect which led Wordsworth to call the Staubbach "The heaven-born waterfall."

This cascade has its winter as well as its summer moods; for, besides being behung with icicles from top to bottom, it congeals from below upwards, like an enormous stalagmite, into a pyramidal ice-mass, which rises and rises until, it is said, it attains to an altitude half its height! A footpath leads to the summit of the fall, to gratify the curious; but few attempt it.

VII.

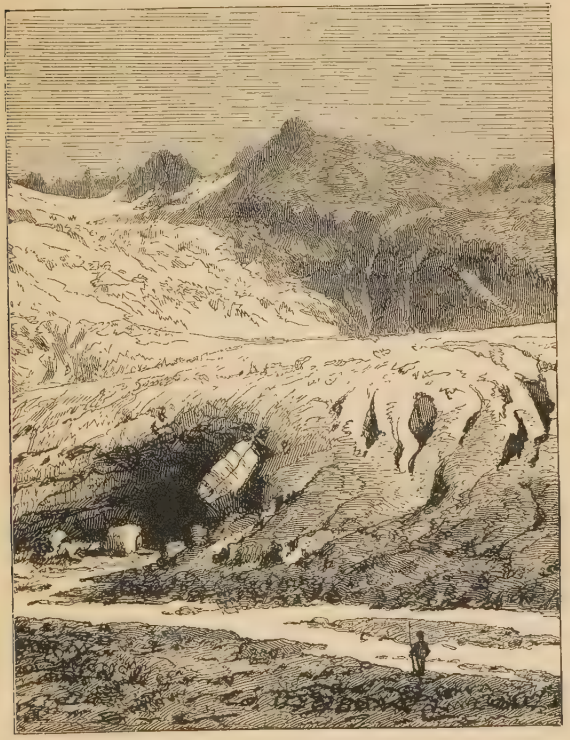
The Glacier Fountains of the Rhone.

THE Rhone, which is one of the most rapid rivers in the world, rises in a glacier of Switzerland upwards of 20 miles in a direct line east from the Staubbach, and after a course of 664 miles in length and of varied character, mostly impetuous, falls by several mouths into the Mediterranean Sea at the north-eastern margin of the Gulf of Lyons. After rising at an elevation of 5726 feet, and traversing the Canton de Valais south-westward, increased by numerous affluents, it falls, by a bend northward, under precipices 8000 feet high, into the eastern extremity of the Lake of Geneva, its level above the sea diminished already to 1350 feet. Of a milk-and-water complexion at its source, it flows onward until, as it enters the lake, it is of a turbid yellow; but as it traverses its fifty miles of length without mingling, it undergoes filtration, and finally, by a chemical process which no one has expounded, issues from the western extremity clear as crystal, and of the colour of indigo—"the blue waters of the

arrowy Rhone." It does not, however, proceed a mile beyond Geneva before it is again rendered as turbid as ever by the waters of the Arve, which here come down upon it troubled from the glaciers of Mont Blanc; and it never recovers its composure again throughout its course till its waters are merged and lost in the blue Mediterranean wave. Just where it bounds through the gorge of the Jura, and crosses the frontier of France, it used to dive suddenly under a tunnel 400 or 500 feet long, formed by overarching fragments of fallen rock, and called, at its immersion, the Loss of the Rhone; but these fragments have been removed. It is navigable as far as Lyons, though with difficulty, on account of the current and the shifting sand-banks, and not at all but for the canals which connect it with the Mediterranean, and even the Loire, the Seine, and the Rhine.

Its fountains, and those of its affluents, are mostly in the glaciers of the Alps, and result partly from the melting of these masses at their upper or under surfaces below the line of perpetual snow, and partly from springs which percolate continually through veins in the rocks of the mountains whose upper valleys these glaciers fill. The Rhone-glacier proper, the highest source of the river, occupies a northward extending valley in the extreme north-east of the Canton de Valais, and inserted like a wedge between the Cantons of Berne and Uri, which here run southward, the one to the right of it and the other to the left. This glacier is one of the most grandly im-

pressive in Switzerland, and fit first-parent, it has been remarked, of so lordly and majestic a river. From



HIGHEST SOURCE OF THE RHONE.

underneath its lower extremity the river first emerges, a more or less huge irregular vault of ice arching it over, which seems, as you gaze into it, a deep,

dark, receding cavern. This vault is ever changing its form and aspect, and sometimes, mayhap, it collapses and falls in, blocking up the stream, which then bursts through the crevasses above, sweeps all away, and leaves a vault again. The river, as it here emerges in such flood, is greater, you at once conjecture, than the slow melting of the glacier alone can produce; and so, ascending its western, or right bank, you find, well up, a fine waterfall at play, pouring its waters down a crevasse in the glacier more than a hundred feet deep, and scattering around a cold, misty spray. The valley, the head of which the glacier fills, is called the Furca, or Fork; and the glacier looks as if it lay reposing on the strong bosom of a mountain, whose awful form guards it from above. Mount St. Gothard lies to the east of it, and east of that the source of the German Rhine—point this worth fixing in our geography once for all.

The affluents of the Rhone, equally with the Rhone itself, have, we say, their sources in Alpine glaciers; all those, at any rate, which add any considerable body of water to the main stream. Of these we shall mention only the Arveiron, which issues from the celebrated Mer de Glace, and loses its waters soon in those of the Arve, as these at length do in the waters of the Rhone, a mile below Geneva. The Arveiron rises three miles above Chamouni, and is reached from this village by a good road which follows the southern bank of the Arve; and,

by a detour to the right, in a little conducts even vehicles to the source itself. The waters here, as at

SOURCE OF THE ARVEIRON.

the Rhone glacier, are seen emerging turbid from a dark grotto or cavern under a deep-blue vault of ice,

which at one season you will find arching itself over the stream to a height of 100 feet, and at another depressed to 30 feet. So stable is the appearance of this arcade, that the daring or fool-hardy are not unfrequently tempted to assay explorations; but the risks are serious, and more than one of these adventurers has paid for his rashness with his life. This arch, composed as it is of separate, mostly large, blocks of ice, supporting each other, is not always, in the thawings and shiftings of these, in the most stable equilibrium, but so ticklishly balanced sometimes that the report of a pistol will—as at the Rhone glacier once, when two boys were buried in the ruins—bring the whole with doomsday crash about your ears. This ice-grotto is at the nether extremity of the Mer de Glace, which is here called the Glacier du Bois, that is, "Glacier of the Wood;" presumably because of the pine-forest seen to the rear of its fore-front, and now dominating it on the left. This glacier, like the rest, sometimes retires back the valley, and sometimes advances lower down: thirty years ago, it seems, it came short of this forest, which it has now outstripped. The scenery around is very grand;—there before you is the black unfathomed darkness of the cavern, the deep azure of the translucent vault above it, and the green pine-forest waving mysteriously on the heights beyond; while at your feet dashes the torrent of the Arveiron, tumbling away before it the boulder-masses which the glacier has borne hither from the

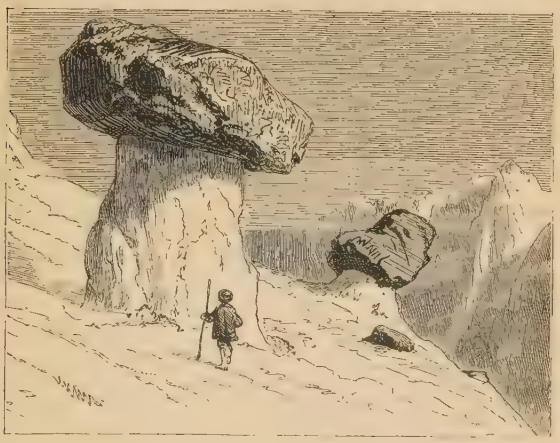
mountain sides, and not resting till it has delivered every one of them, with a tenderness of its own, to the tenderer mercies of the Arve below.

It is to the melting of the ice of the glacier, we have said, the creation of these Rhone-sources is chiefly due. This melting into water—for there is a melting from snow into ice-grains, which takes place above—goes on exclusively below the snow-line, and varies with the season and the height. Agassiz found the glacier of the Aar at mid-height sweat itself down one summer ten or eleven feet, and in the month of August alone four feet; while by the end of winter it had, by simply hibernating, recovered all its wasted muscle and even waxed fat. The water which the melting creates on the surface flows partly down the crevasses with which it is everywhere slashed and pierced, and partly into the minutely-porous, spongy tissue, which composes its mass. The liquid, which thus enters above, collects beneath, where it forms and flows in a channel, to emerge, it may be, as a torrent where the glacier ends. But it is not merely by melting at its surface that the glacier contributes to augment this torrent: the walls of its cavities are corroded, so to speak, and widened both by the warmth of the spring and melted waters which pass through them, and by the currents of air, often 12° above freezing, which these create in its interior. So extensive are the caverns underneath the glaciers which these causes produce, that they have been

penetrated in one case from the mouth upwards to a distance of 650 feet, and been found in another to vault themselves into an ice-pillared dome canopying an area a quarter of a league square!

Two opposite phenomena result from the presence of foreign bodies—such as gravel, slate, boulder-stone —on the surface of the glacier while the melting proceeds. In one case, the presence of such bodies, by their susceptibility to the solar heat and power of imparting it to the ice below, causes depressions, or "noon pits," as they are called, on the face of the glacier; while in another, when their mass is large and impermeable to such influences, a protuberance is the result, in shape and appearance resembling a mushroom. The ice in this latter case melts away all round the boulder, leaving it high and dry; and the more the face of the glacier is depressed by the melting, the higher it appears to rise, and the slenderer the ice-column on which it rests. This latter result is due to the direct action erelong of the sun's rays on the supporting column, and the reflection thereof from the surface of the glacier itself. These protuberances are called *glacier tables*, and they are especially characteristic of the glacier of the Aar. From the melting which takes effect upon their columns being greatest when the sun is due south, that is, at mid-day, and therefore on their southern side, they have an inclination or dip in the main towards the meridian; nay, from the sun's rays playing upon them at different angles from

morning to evening, they become a species of dial or sun-clock, like sun-flowers, and tell by their oscillations, to a good eye, not merely the points of the compass, but actually the hours of the day. When the column becomes too slight to uphold the block,



GLACIER TABLE.

so that it falls, or, as is usually the case, when the block from undue inclination slides off the pedestal, it will often hollow for itself a new bed lower down in the glacier, to be raised again on a new pillar, only however to fall anew.

VIII.

Fountain of Banias,

AND OTHER SOURCES OF THE JORDAN.

RIVERS have their individual peculiarities as well as human beings; and of all the rivers on the globe, perhaps the most peculiar is the Jordan. Apart from its connection with the most miraculous events in human history, through which it has come to be invested with something of a sacred character, it has singularities of a physical nature possessed by no other river yet discovered on the face of the Earth. Though, for example, with one exception, the steepest, for its length, of all rivers, sloping eleven feet per mile, it is "the crookedest river that is," traversing about two hundred miles to reach a point only sixty miles away. Its bed, too, from Lake Merom downwards, is one enormous rent or fissure in the Earth's crust, which, as it extends southward, becomes deeper and deeper, until at the bottom of the Dead Sea, where it terminates, it is one-half mile below the sea-level, and one-half more below the site of Jerusalem. In its

descent, the river has three stages: the first at Lake Merom, the second at the Sea of Galilee, and the third at the Dead Sea, where it rests. Between the first and the second it descends above four hundred feet, and between the second and the third one thousand feet, rushing, in this last case, at intervals, over no fewer than twenty-seven rapids. Two or three miles beyond Lake Merom the river-bed begins to descend below the sea-level, overlooked all the way by high lands to right and left; to which, from the river, the ground rises upwards, on both sides, by a succession of at first two terraces or banks, and at length three. The space between the first bank and the river is, owing to the excessive heat, filled up, especially where the banks are near each other, with an exceedingly rank vegetation; but the same cause renders the margin bare and without verdure not many yards distant from the water. To the depression of its bed it is further owing that the Jordan, unlike every other river in the neighbourhood of civilized life, has—at all events from the Sea of Galilee downwards—not a single city or village on its banks; nor, if we except the plain of Jericho, north of the Dead Sea, do its waters ever appear to have been diverted from their bed to minister to any of the necessities of civilized man. On these accounts, and others, physically as well as historically the Jordan is a very singular river.

But the Jordan is unique from its very beginnings, and is as singular in its fountains as in its course and

destination. The fountains of this river,—*i.e.*, the springs of it which never dry up, but are always living, —are three in number; and these all appear to derive their waters by secret channels from the slopes of Mount Hermon. This mountain, the most southern and loftiest of the chain of Anti-Libanus—being 10,000 feet in height, and, though beyond the bounds of Palestine, visible, it is said, from the furthest extremity of the Jordan—is invested with an interest nearly as great as the river itself. Towering there to the north in its lonely grandeur, "a pale-blue, snow-capped cone," and visible, as we hint, to nearly the very limits of Judæa, it preached a perennial sermon of clear, living, and abiding strength and majesty, to every eye that had once regarded it. If Jordan was the river of Palestine, this, though beyond its confines, was its true high and holy hill—scene, it is now believed, of the transfiguration of the Lord, "when his face did shine as the sun, and his raiment was white as the light." An immense mass of limestone, geologists tell us, it terminates grandly in three summits, of which the lowest is a quarter of a mile west of the second, and the second three hundred yards south of the highest. On the second there are, it seems, traces of the ruins of what conjecture alleges to have been a temple reared to the special honour and worship of the sun.

The fountains of the Jordan, which have their springs in this remarkable mountain, have all their feeders on its western slopes; the waters on the

eastern going to form the Pharpar, the river of Damascus. Of these springs, the most northern emerges near Hasbeiya, at the foot of the mountain, straight west from the summit; while the other two are much further south, and issue, the one from under the ruins of Cæsarea-Philippi, and the other from under what was once the site of the border city of Dan. This last, though not the clearest, and by Josephus called the lesser, is yet in reality the largest fountain, not of the three only, but in Syria, nay, it is said, in the world. It bursts forth, not directly from the slopes of Hermon, but from the north-west side of a curious tell, or hill, which, resembling a cone fallen in, suggests the idea of the crater of an extinct volcano, and rises abruptly well north in the centre of the nearly level plain of Huleh, which, bounded on the south by the waters of Merom, here extends fifteen miles north by five wide. This tell is a green eminence, with a depression, as we say, in the middle one-half mile across, covered sparsely with trees and profusely with bushes, and ascended with difficulty by rather steep terraces all round; while over the fountain which issues from it, says Dean Stanley, "is another swelling knoll, with another level top, well strewn with ruins." From underneath this swelling knoll on the north-west this prince of fountains bursts, full formed and Minerva-wise, at once into the light of day, collecting itself at first in a "clear crystal pool," where, marshalling its waters, it at length

drafts them off in a wide stream equally crystalline down the valley. From the south-west side of the tell there issues another and smaller stream, which joins it, and is at its emergence shaded by a majestic, venerable oak-tree, near which is the tomb of a holy man honoured of the pious Moslem. These fountains, though they come to light as already formed rivers, are the outcome of a countless number of underground rills, which, bearing each its small contribution from afar, here unite, and meeting with an obstruction to their further descent through the Earth's crust, come out at the surface and greet the day. The stream which these two springs go to form is called the Lebban; and this, after a meandering course of ten miles down the valley, finally loses itself in the waters of Merom.

Another fountain of the Jordan, which is called the upper, and by Josephus the larger, lies over the plain from Dan, about three miles to the south-east, and is approached by a path which at first winds evenly over "an unwonted carpet of turf and under trees of every variety of foliage," and at length ascends with difficulty a steep bank entangled with underwood and shaded with oaks. This is the Fountain of Banias, or Cæsarea-Philippi, and it emerges from a cave under a cliff of artificially benched, reddened limestone, on the north side of the ruins of the city, bubbling up to the light by a hundred rills from amid mounds of wreck and rubbish. Issuing on the floor of a terrace overlooking the plain of Huleh, it collects first into a pool, and then, forming

into a stream, it runs southward, west of the city, dashing here and there in spray over masses of ruins, and finally rushing by a cascade into the bosom of a dark deep ravine below. Formed into a con-

FOUNTAIN OF BANIAS.

tinuous stream, it goes by the name of the Baniasy, until, slanting across the plain of Huleh, it joins and mingles its crystal waters with those of the Lebban four miles below the Fountain of Dan. Its fountain,

and the cave it rises in, were the beginning of the city whose ruins lie scattered above and around; the vital origin and centre of the whole being, it seems, the worship of the god Pan, to whom the spring and grotto were in early times dedicated. On this account the place was originally called Paneas, of which the name Banias it now bears is a slight corruption. Pan was the god of wild fertilizing nature, and surely deserved to be worshipped here, if anywhere; for this, by the mere abundance of its springs and rivulets, is one of the most fertile regions on the face of the globe. In the days of Christ the city was called Cæsarea-Philippi, in honour of Philip the tetrarch, its new founder, and of the then reigning Emperor of Rome. But in those days it had become a place of luxury rather than of worship; and truly, were a life of indulgence to a human creature not for ever an accursed one, there are few places where it could be led and might riot in such fulness as it probably once did here. "In its situation," says Dean Stanley, "in its exuberance of water, its olive groves, and its view over the distant plain, almost a Syrian Tivoli." The heights of Hermon behind the city are wooded to the top, and overlooking it, one thousand feet up, are the ruins of one of the strongholds, in crusading times, of the Old Man of the Mountain. Cæsarea-Philippi is especially memorable as the near neighbourhood of the spot to which Christ retired with his disciples when he had finished his work as a teacher, and where he sadly resolved

to return and bear witness, for the last time, against the men of Jerusalem.

The third and last fountain of the Jordan we have to notice lies nearly twenty-five miles in a straight line up the valley from Lake Merom, and is situated near the village of Hasbeiya. It engenders a turbid stream called the Hasbāny, which flows southward, and, after being augmented by other streams, sweeps past its sister fountains a mile to westward, and falls into the Lebban five or six miles above Lake Merom. The source of this stream is by all accounts as beautiful and copious as the others, and is only less noted because of its remoteness, and the unwillingness of the Jews to search for the sources of their sacred river beyond the confines of their own land. The stream itself is remarkable for winding its way in one part of its course through a tortuous rent in a lava-rock two hundred feet deep and as many wide, while its banks are beautifully adorned with oleanders, willows, and sycamores, and its waters alive with fish. This stream, from its fountain downwards, is, like the others, the offspring of innumerable veins and veinlets of water, which, seen and unseen, have their beginnings high up the slopes of Hermon; and which, when collected, serve, so profuse is Nature, little other immediate purpose than to minister to the temporal necessities of some thirty or forty encampments of wretched, worthless Arabs, squatting on the plain of Huleh below. This plain—which, as we have said, is on the average fifteen miles

long by five wide, and terminates at its southern border in the wedge-shaped Lake of Merom, with a marsh spread out to north of it, often abounding in water-fowl and always waving with reeds—is, for luxuriancy and beauty of vegetation, equal to any spot on the globe, watered as the garden of the Lord, and flowing literally with milk and honey; and yet it is virtually a waste, seeing, rich as it is in all natural resources, it is spiritually and morally little other than a land of drought and barrenness.

IX.

Scenes in Greenland.

GREENLAND is now admitted on all hands to be an island, entitled, however, like Australia, from its size to rank as a continent, being 1200 miles from north to south, or twice the length of Great Britain. The interior is understood to be occupied by an enormous expanse of mere ice, which, as fed by descents of snow from the mountains and the atmosphere, slopes and moves slowly northward, and sends off, now to the right, now to the left, along ravines formed by them and terminating in fiords, branches themselves stupendous, that for most part overhang and even invade the sea. One of these, called by Dr. Kane the Humboldt Glacier, and approaching by its northern flank within 10° of the pole, advances from the central ice-mass upon the sea westward, and terminates in a cliff-like front 60 miles long, 300 feet high, and of unknown depth; whence, pressed forward by the mass behind, piles of ice of all sizes detach themselves, which, buoyed up by the water, float away

as icebergs, covering the seas. This glacier is by its discoverer set down as the northern boundary of Greenland, and may be regarded as the central one itself, trending west. Beyond it land re-appears, which a party of Dr. Kane's men explored to within 520 miles of the North Pole, and to which Dr.

ICEBERGS FORMING.

Kane gave the name of Washington. The south-west corner of this land rises into a rocky promontory named Cape Forbes, and the north-west into another called Cape Constitution, where the land, rising into cliffs 2000 feet high, appears to trend away east, and whence, looking athwart the channel on the left, the eye can see the opposite or strictly American

shore stretching, or rather undulating away straight northward for fifty miles, till it is lost in the distance. The channel between was found by Dr. Kane's men, to their infinite surprise, when they visited it on the 23rd of June, to open gradually into an iceless sea; which, from the data they supplied him, Dr.

CAPE FORBES.

Kane calculated to cover an area of 4000 square miles, and which he faintly conjectured to be due to a deflection thitherward of the Gulf Stream.

Only the coasts of Greenland are inhabited, and even these sparsely, and, except by Esquimaux, not higher than latitude 73°. The settlements are principally of Danes, for trading purposes; but on the west

coast there exist three founded for other purposes, by the Moravian missionaries. The Danish colonies or factories number only thirteen—the Danes themselves a few hundreds; and the trade they ply is carried on with the natives by barter, without the medium of money—skins, furs, oil, cod, &c., being received in exchange for wheat, brandy, coffee, sugar, tobacco, utensils, &c. Everything the natives have to dispose of can be got by barter. Dr. Kane hired a young Esquimaux for hunter by leaving with his mother two or three barrels of bread and a few pounds of pork. Reindeer-hunting is a favourite occupation in summer; and the skins are sold and sent to Denmark, where they are much prized for their lightness and warmth. These are also used by the natives themselves, as well as seal-skins—which last are in especial demand for pantaloons and waterproof over-alls. Fishing is the chief employment, yields the staple commodity, and is directly and indirectly the life of the people.

The Danish part of the population are a homely, simple-hearted, pious class, who are quite ready to give and receive friendly tokens with strangers. The Moravians, though also hospitable and kindly, are more demure, and of an old-fashioned cut, as of people who had long since seen better days. The Esquimaux are a faithful race, if you can make friends of them; but toward strangers they are invariably distrustful, false, and dishonest. Their broad shoulders give them the appearance, when seated, of

being tall men; but their extremities are short, and so, when erect, they rather come under than exceed the average height. They are of squat figure and feature, and spend their time in hunting and seal-catching, except when they eat and sleep, which they do inordinately. Their chief diet is animal food, which they prefer in the raw state, and the blood is an especial delicacy. They move about in small communities, are of extremely filthy habits, and house themselves for the winter in huts, or snow-houses, amidst a stifling accumulation of oil and offal, quite intolerable. These are the natives of Greenland, and they belong to a nation which, though the most sparsely, is the most widely scattered of any on the face of the globe.

Greenland has been explored much further north on the west than on the east coast, owing partly to attempts, now at length deservedly given up, to find a passage westward round the north of America, and to the efforts made to recover the party of Sir John Franklin, lost in the last of these attempts. Explorations in this direction have always been attended with great difficulty; for the ice is late in breaking up, and the sea, when open, is infested with fogs and icebergs, together with currents and storms altogether baffling to navigation. The seas, too, are narrow, north of Baffin's Bay especially, and the shores bold and rock-bound; only the ships are never in danger of being wrecked upon the rocks, as the ice never melts entirely away from their bases.

The ice which attaches to the bases of these rocks, and is called the ice-belt, becomes gradually covered with piles of rubbish and masses of stone or slate, rounded and angular, which have fallen from the cliffs above; and this breaking up, under the action of the water-torrents and thaws of summer, divides into ice-rafts, often of large dimensions, which then float away to your peril, each with its more or less ponderous cargo, down the straits into the open sea. Besides, to make explorations of any extent, one season signifies nothing, and so the ship must be provided with men and means able to hold out through an Arctic winter. A winter spent in these regions is something truly frightful even to a native, still more to one who is not; though there have been Americans as well as Europeans who have stood out two in succession, and come south again alive. In North Greenland, for one hundred and forty days in this season there is no sun, for ninety or more no twilight; the temperature is on the average 60° or 70° below the freezing point, often as much as 90° or 100°, and by no device can the frost be excluded from hut or cabin. The dogs you carry for the sledging, which is essential for exploration, must be provided for, and probably three-fourths of them die on your hands, of lethargy, delirium, and lock-jaw. The men, too, cannot be prevented from taking scurvy, and becoming swollen and haggard. A month, or even a week, will work greater changes upon their appearance than a year will at home; and

when the season returns and excursions are attempted, there is the danger of being frost-bitten, as well as of stupor and snow-blindness. The snow, if eaten, burns like caustic, inflames the mouth and throat, and causes speechlessness. Your men, too, are apt to mutiny, your ship to be ice-bound, and if your dogs die, as is most likely, you have no alternative but to face death, or risk the hazardous enterprise of escaping southward in an open boat. This was Dr. Kane's alternative in 1855; he had sailed north with eighteen of a crew in the brig *Advance* in 1853, spent two winters in lat. 78° 30′, and after penetrating as far as lat. 81° 20′, and losing two of his men, had to abandon his brig and commit himself and the remainder of his crew to boats.

The coasts in this latitude he found to be high, broken at intervals into fiords and by the channels of glacier-fed rivers, and composed chiefly of red sandstone rock; which contrasts, says Dr. Kane, most pleasingly with the whiteness of the expanse of snow, associating the cold tints of the dreary Arctic landscape with the warm colouring of more southern lands. This rock rises often from mounds of rubbish and ledges of ice into continuous cliffs of in many cases 1000 or 1200 feet of perpendicular height; and the action of air and water upon their stratified surfaces gives them often the appearance of piles reared by the mason-craft of man. The most picturesque of these cliffs Dr. Kane found about lat. 79°, near Dallas Bay, and several miles south of the

Humboldt Glacier. Here of a sudden the rocks at the foot of a gorge surprisingly assume the form of a battlemented castle of imposing grandeur, frowning in dark shadow when Dr. Kane saw it, while the gorge whose entrance it commanded "was stream-

THREE BROTHER TURRETS.

ing at noonday with the southern sun." On the flank of this "dreary semblance of a castle," and completely isolated, rise in a line three pillar-like masses of sandstone rock, to which he gave the name of "The Three Brother Turrets." A sloping mound

of rubbish led to the gorge thus guarded, and as the castellated structure was at the time in shadow, the contrast between it and the surrounding whiteness made the illusion perfect. Not far from this to the northward, at the northern extremity of a long cliff of greenstone, that, "as it rears itself from a crumbled base of sandstone," resembles the "boldly chiselled rampart of an ancient city," and quite detached from it, there rises a single pillar more striking still, the shaft of which, as it overlooks a deep ravine, resembles a gigantic Trajan's Column, and is 480 feet high, while the pedestal it stands upon is 280 feet more! It seems as if designed and wrought by art of man to decorate the square and keep alive the heroic memories of some world-city; and yet Dr. Kane, when he saw it standing there in its solitary majesty, was reminded, in the then mood of his inner man, neither of high cities nor of their proud memorials, but of the surpassing grandeur of a single life melodiously led, and rendered, as it were, apart from and above them all. Such to him, communing in these solitudes, seemed the life of Tennyson; and so he not inappropriately called the pillar "Tennyson's Monument."

X.

The Pitch Lake of Trinidad.

TRINIDAD—that is, Trinity—where this large natural pitch lake occurs, is the most southerly of the West India Islands, and a Crown colony of Great Britain, lying north-west from the mouths of the Orinoco and close to the South American Continent, from which it is by one of its headlands only nine miles distant, and by another thirteen. Its name is derived from a Latin word which signifies "three at once," or "three in one;" and it was given to it by Christopher Columbus doubtless in homage to the Holy Trinity, whose guidance and guardianship the three peaks by which it was first sighted, on the rim of the far distant horizon, from the mast-head of his ship in 1498, might not unnaturally suggest to his pious mind. It is, in the main, of quadrangular figure, extending fifty miles from north to south, and above thirty from east to west, and presents on all sides except on its western shores, which are low and level, a bold, and often steep and lofty, front to the sea.

THE PITCH LAKE OF TRINIDAD.

It slopes on the whole westward, and its northern and southern coasts are fringed all the way by mountains, of which the northern attain to 3000 feet in height, and the southern to 1000 feet; while another chain of the same elevation as the latter cuts it nearly through the middle, and stretches also east and west. These mountains are crowned to their summits with dense, waving, luxuriant forests, which, where they verge on the sea, dip their rich, graceful foliage, down into the water; and the plains which lie between them, with the valleys running into them, afford a very fertile soil, fitted for the cultivation of sugar, coffee, cotton, and tropical fruits. The climate, though hot and moist, is, for the West Indies, not unhealthy; and the colony, as things go in that quarter, is rather a thriving one, having in the ten years which preceded 1861 added to its number 15,000 souls. Its present population is 90,000.

The Pitch Lake, for which this remarkable island is famous, is situated on a small peninsula near its south-western extremity, at an elevation of eighty feet from the sea-level, and three quarters of a mile from the sea-shore. It is three miles in circumference; covers an area of nearly 150 acres; and is composed principally of bitumen or asphalt, of which it is the largest natural deposit anywhere on the globe; and this substance, though hardened and solidified round its margin, may be still seen bubbling up hot and fluid through the water in the centre. Composed, as it oozes through the bottom of the lake, of carbon and

hydrogen in the proportion of four to one, it exists, on its first appearance, in a state of pure fluidity, and being slightly lighter than the water, rises to the surface and floats; but as the oxygen in the air acts upon and combines with it, it thickens and hardens it, without increasing its gravity, and this is gradually united to the already solid mass. The quantity of bitumen which the lake contains, though clearly of unparalleled amount, has never been ascertained; but the spring from which it issues is in unceasing action, and yields bituminous matter which may be seen floating on the adjoining seas. Its formation is thought to be in every case due to the decomposition of vegetable matter under the agency of fire or heat; and the tarry substance which we often see oozing through the surface of the coal in our ordinary fires is nothing else than bitumen similarly originated and produced. Whether it is possible to trace the connection between it and the vegetable matter from the decay of which it is supposed to owe its origin, is a question; but it is never met with in nature in a separate state, as it is here, out of contiguity with volcanic forces; and of the action of these there is clear trace all through the island, but especially in the neighbourhood of this lake, as also at various points along the coast, where their presence is evinced by the occurrence here and there of several submarine volcanoes.

In its purity, the substance of which this ooze consists goes under the names of naphtha, petroleum,

rock oil, &c., is fluid, and contains no oxygen; but when impure it is more or less solid, combined with oxygen, and called bitumen or asphalt. In its purest form it is highly combustible, nay, explosive, and therefore dangerous; and in every state it is of inflammable quality, and burns with a dark-red, smoky, and mal-odorous flame. There is a kind of it, found in two or three different localities, which possesses flexible, elastic properties, resembling those of caoutchouc, for which it can be used even in effecting erasures from paper. Bituminous matter is frequently extracted from gas-tar, and is, both as a natural and artificial product, turned in many ways to practical account by man. Not to speak of the uses it subserves in the form of naphtha, &c., it is, as asphalt, employed in the seasoning and preserving of timber; which, as in the construction of ships, dams, piers, and out-houses, is liable to be eaten into by insects, or to corrupt and rot away under the action of the atmosphere and sea or rain water. It forms an ingredient also in the composition of the paste which imparts the peculiar polish to the surface of patent leather; and it is familiar to every one for the service it renders in the construction of roads. It is of less repute with us in this respect than at the first it promised to be; but such as it is it contributes to road-making by being first boiled to a certain temperature, and then mixed with dry sand, gravel, and lime.

XI.

Natural Bridges.

NATURAL Bridges are to be met with in various regions of the globe, and some of them are not unworthy to rank among its wonders. They are almost all formed by the action of water, which, worming its way through crevices in rocks, or the soft, porous, soluble strata underneath, gradually, by abrading or dissolving the face of the channels it permeates, scoops out for itself a wider and a wider passage. If the water percolates the strata near the surface of the rock opposing it, the result is erelong a stream open to the light throughout its course; but if the percolation takes place at a depth below, an arch or vault is left overhead, which shall be wide or narrow, straight or tortuous, long or short, according to the breadth of the rock, and the regular or irregular softness and solubility of its substance. It is thus, for instance, that caves are formed; and if the compartments of the cave are of various dimensions, and at different levels, this is because the rock yields more readily to the solvent

or the abrasive power of the water in one part of its mass than another. Limestone rocks are, above all others, most susceptible of such corrosion, and it is in them accordingly caves principally exist. Yet is water not without effect on rocks of a firmer texture, especially when to its power of melting is added the friction due to its agitation or motion. By means of it—acting, however, mechanically or frictionally rather than chemically—Fingal's Cave seems to have been formed out of igneous rock, or basalt; and in Sicily, the largest river which issues from the base of Etna is known to have, within two hundred and fifty years, worked a channel for itself nearly 100 feet broad and 50 feet deep through a hard uniform mass of fire-made rock, which at the beginning of that period came pouring athwart its bed in the form of lava.

This action of water in percolating, and so perforating rocks, in a way to account for natural grottoes and bridges, is a phenomenon attested by the structure of every river on the face of the globe: not one of them but is fed through the medium of water-formed channels of various calibre, which permeate to all lengths the mass of the mountains where they have their springs. But not only are these perforations universal at the sources of rivers, of any extent at least, they are not unfrequently seen to be formed by them after they have begun their course. The Rhone, just where it bursts through the passes of the Vosges into France, we have already seen, used to dis-

appear suddenly underground, and flow through a secret channel it had widened, if not wholly formed, to a distance of about 500 feet. The Lys has already had a long journey, and is arrived in Belgium, when it abruptly dashes over a precipice, and is lost to vision for nearly half a mile in the Grotto of Han. The Meuse, too, has a subterranean course it has formed for itself, extending to a distance of six miles. And the Dromme, a river in Normandy, strangely precipitates itself, at some distance from the sea, into a "hole" 39 feet wide, known as "the Pit of Soucy;" but it has not yet completed the work of perforation, or wrought for itself a clear passage through the mountain, for it never re-appears again, except in the form of new springs, which are understood to arise from its lost waters. But perhaps as remarkable an instance of this mole-like engineering faculty on the part of rivers is to be found in two small streams of Derbyshire in England. These streams, the Hamps and the Manifold, after their formation at separate springs, turn in severally under the face of a hill-range, flow on for miles underground, until at length they re-emerge to the light by apertures only fifteen yards apart, each with its original individuality distinct and uncorrupted. Their waters have not throughout their subterranean course for once intermingled, for they are at the point of issue of different temperatures; and that they are the same streams from first to last is proved by this experiment, that floating bodies which have been absorbed at the

swallows are borne away by them down their channels to re-appear when they revisit the upper light.

If the caverns which the waters at and throughout their disappearance go to form are of limited extent, and widely open at the two extremities, there results what is called a *natural bridge;* and this is a phenomenon which is found still to subsist, where the water which formed it has either long since changed its course and taken itself away by other channels, or is now seen wriggling along far below, shrunk to a shadow. Of natural bridges, one of the most picturesque is that of Icononza, and of it the reader will find a view and description in " Nature's Wonders," page 49.

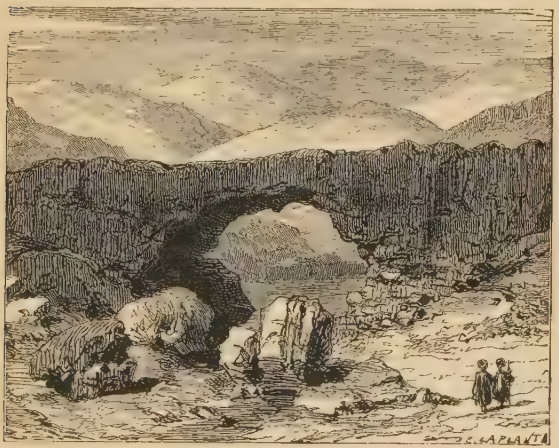
The bridge of Arc, which is nature-formed and spans the Ardèche in France, has an elevation of 97 feet and a width of 190 feet; while that of Véja, near Verona, attains a height of 116 feet. But the two most stupendous natural bridges in the world appear to exist, the one on the western flank of Lebanon in Syria, and the other in the western district of Virginia, United States.

THE ROCK-BRIDGE OF LEBANON.

This bridge is situated far up the slopes of the mountain, under the brow of snowy Sunnîm, the second for elevation of the Lebanon-peaks, between twenty and thirty miles north-east from Beyrout. It nobly spans a torrent, not far from its source,

called 'Ain-el-Lebn, or Fountain of Milk, and which, with another called 'Ain-el-'Asil, or Fountain of Honey, goes to form the Lycus or Dog River of the ancients. The arch at its lower side has a height of nearly 200 feet, its span is about 160, its width 140, and its thickness a-top 30 or 40 feet. It forms to this day a bridge in the great north and southward extending highway, "the *highest* in the land, creeping cautiously along the very uppermost shelf of the Lebanon," and may be very readily crossed by the traveller in these parts unnoticed and undreamed of. It is seen to best advantage down a little way, and from the bottom of the ravine it overarches; and here it presents the appearance of "a semi-circular arch, slightly oblique, with regular abutments." The scenery around is bleak and rugged, and the spot is little known and seldom visited. The brook which trips playfully away beneath its archway is of crystalline purity, and, even in summer, of icy coldness, and owes its name to the pleasant sensations and images such waters suggest so naturally to an Oriental fancy. It issues direct from the snows of Sunnîm, and when it leaves the bridge it enters and traverses the bottom of a narrow rent or fissure in the rock, from which it at length emerges, leaping wildly over a precipice in a thin sheet of foam. The bridge and its environs were at one time less desolate and deserted than they now are; for not many hundred yards away from the bridge itself exist, westward and southward,

ruins which point to the period of the Roman Empire—relics of a tomb, a temple, and a village, all forgotten now, even the very names. The Dog River, too, into which this now lonely 'Ain-el-Lebn flows, may be said to be even rich in memories, both mythical and monumental, reaching far back into the depth of primeval time. The name it bears is



ROCK-BRIDGE OF 'AIN-EL-LEBN.

derived from some dim, distorted recollection, even in ancient memories, of some dog or wolf-like monster chained by fate to its mouth, whose barkings or bayings, not at the moon but at Neptune, when in fury he lashed the rocks with his waves, were such as to appal the natives of even far-off Cyprus. It was an ominous howling, the tradition goes on to

say, which, issuing from the brow of a cliff at its mouth, when the wind was high, terrified the tribes around, for days and even years after, with the boding thoughts of some dreadful judgment to which they were all doomed. Nay, so intolerable, the myth says, did the horror its repeated bellowings awoke in them become, that they leagued together as one man, and, in the spirit of Prometheus, marched defiantly to the spot, wrestled, as Hercules by himself used to do, with the monster, threw him, and, by combined effort, cast his body over the rock into the depth of the sea; thus by one act, at any rate unmistakably heroic, ridding their country of one unquestionable nightmare from the pit, and not likely thenceforth to trouble it again to the end of time. The Dog River our bridge stands connected with is rich in memories of another kind, as the numerous monuments, left by nearly all Oriental peoples on its banks and in its neighbourhood, so profusely testify. Here are traces of Egypt, Assyria, Persia, Phœnicia, Greece, and Rome, and memorials alike of the Crescent and the Cross. "Nowhere else," says Thomson, "known to me is there to be found such an assemblage of ancient mementoes as are grouped together in one spot here."

THE ROCK-BRIDGE, VIRGINIA.

This bridge spans a rock fissure or chasm about one hundred and sixty miles nearly due west from Richmond, and is approached generally from Lex-

ington, which is exactly twelve miles to the north-east. The road thence is, it seems, for its mire and roughness, unhappily one of the most wretched, professing to be a road, anywhere to be met with, and is in rainy seasons often totally impassable; so that the bridge can at such times be reached only by a succession of deflections and crossings which extend the route, while they hardly improve it, to seventeen or eighteen miles. So execrable is this road, we are told, and such a penance is it to traverse it, that the Americans can compare it to nothing but purgatory—by which name accordingly they scruple not to distinguish it; a designation which in their hands appears to have passed into a common one for any place where the nerves, unless preternaturally strong, are likely to be more than usually tortured. Nevertheless, "hard though the way be," the bridge it conducts to is not only worth seeing, but, what Dr. Johnson would not allow of the Giant's Causeway, worth going to see, especially if you are "touring it" in these parts at any rate; and it is a cheap bargain you have made if you see it even at the expense of the worst discomforts a journey thither will cause you. "Reader," counsels one who has been there, and who knows, and subscribes himself Peregrine Prolix, "do not allow the coldness of your neighbours, or the heat of the weather, or the badness of the roads, or the goodness of your equipage, or the inertia of your disposition, or the gravity of your baggage, or the levity of your purse,

or the nolition of your womankind, or any other creature of any other kind, to prevent you from going to see the Natural Bridge;—you never saw its like before, and you will never see its like again."

Well, then; understand that this remarkable bridge spans a ravine which, from its brink downwards, is below the level of the surrounding country; and that, being sixty feet wide and of strength sufficient, it is, like the one in Lebanon, crossed by a road, from the sides of which it is barely possible for the steadiest head to look down into the abyss below without vertigo. Not from this position, however, is it customary for the tourist to obtain his first view of its immense proportions; it is usual rather to form a first acquaintance with it by a descent by a winding rocky path formed in a side of the ravine, and by inspection of it from the bottom of the ravine itself. The very first glance from this point strikes the beholder with mute astonishment, and a sense of the utter impotency of all the art of man to express or delineate its matchless grace and majesty. It has an elevation of above 210 feet, a span of 90, and a breadth, as we have said, of 60 feet, while the thickness of the arch in the centre is 45 feet, and towards the abutments 60 feet. The piers of the bridge are perpendicular; its arch is covered a-top with soil sufficient to root and grow considerable trees, which from this position are seen crowning it; and you have an opportunity of estimating its upward dimension by contrast with certain kings of

the forest, which, springing from the margin of the brook, nevertheless come far short of reaching the point where its curvature commences. The ravine it arches is traversed by a stream called the Creek River, and it is from its banks, some sixty yards below, experience teaches visitors the choicest view is to be had. From hence the arch looks more slender, airy,

ROCK-BRIDGE, VIRGINIA.

and elevated, than from any other point of view; and the conjunction of soft gracefulness with massive strength it here exhibits is not outreached by any other natural wonder in the world; nay, its airiness is such that it seems, in spite of gravity, supported by its own buoyancy.

The impression it makes, seen from a point as far

above the bridge as the previous point of view is below, suggests graver thoughts, and under its influence the spirit is weighed down rather than lightened and elevated, the general aspect being more solid and sombre. The view of the arch from immediately underneath it, has an effect upon the mind especially pleasing, the symmetry or proportionateness of form it here reveals is so choice and perfect. The walls of the ravine, too, scanned from this point, are in both directions of a nature grand and imposing—so gracefully wavy are the outlines and so varied the aspect, its bare blue rock alternating so strikingly with the rich green foliage which here and there drapes it. A little above the bridge on the west, for the ravine extends in the main from north to south, the face of its cliff breaks into buttresses, which rise into separate pinnacles to a height of about 250 feet. These pinnacles are sometimes scaled, from the upper level of course, by daring adventurers; but it requires a strength of nerve and coolness of brain, or rather perhaps, as P. P. suggests, a thickness of skull, almost preternatural, to qualify one for such an enterprise and insure a composure of mind sufficient to gaze steadily into the yawning gulf below. The walls of the ravine, from which these pinnacled buttresses stand out in relief, are of solid rock, for the most part perpendicular, and, though not water-worn, they are thought to have formed at some remote period the sides of a cavern, probably miles long, of the roof of which

all that remains is the width of 60 feet, which now constitutes the arch of this marvellous bridge.

This bridge gives name to the county of Virginia, in which it is situated, which accordingly is called Rock-bridge county; and it affords the only passage there is, for miles above or below, for crossing from one side of the ravine to the other. Underneath the arch, some 30 feet from the bottom, the tourist has pointed out to him the letters G. W. graven in the rock. These are the initials of George Washington, who was a native of Virginia, and is said, when a boy, to have scrambled so far up the rock here, and proudly left behind him this memorial of the daring feat.

XII.

Monte Tafonato;

THE PERFORATED MOUNTAIN.

MONTE TAFONATO—that is, mountain which has been perforated—is one of the highest mountains in the rugged island of Corsica, and famous for an opening drilled as it were through and through it, near the summit. It is a solid mass of fine red porphyry, nearly 8000 feet above the sea-level, and forming the buttress or prop of another mountain 600 or 700 feet higher. The opening to which it owes its name is several yards in diameter, and has its axis so inclined and situated as to afford at certain seasons a passage to a flood or shaft of light-beams from the sun when near its setting, such as to form a strange and striking contrast with the sombre shadow of the mountain, athwart which they in so weird-like fashion stream. No one can say exactly what may have been the geological cause of this singular perforation; and meantime, in defect of a theory which will satisfy a scientific inquirer, a not uninteresting legend is at

hand to account for it. This last has found such favour with a learned Abbé, who lately wrote the history of Corsica, that he gives it as the true explanation, nothing doubting. This perforation, he assures us with all gravity, is the work of a demon, who in a fit of spleen did it to spite, as he foolishly

MONTE TAFONATO.

thought, the good St. Martin! St. Martin surely could have no objection to the creation of a new avenue for light in so dark a world, and the demon surely outwitted himself if he thought this would be a source of grief to the holy man.

But indeed this perforation is difficult to explain, and the Abbé Galetti is not without reason for ad-

hering to the old legend as the true account. The phenomenon is a rare one, and a rock-perforation sometimes classed along with it is now admitted to be an artificial excavation. This is the tunnel under which the road from Pouzzoles passes just where it enters Naples, near the sea. It is above half a mile in length, ninety-six feet in height, and twenty-five or thirty feet wide; but it was originally a stone quarry, and it was the quarrymen who, before they left off working it, opened it up from end to end. Another mountain in Norway is drilled through similarly into a funnel-shaped perforation of the same length, and with an opening 150 feet wide, such that the sun may at certain seasons be seen pouring its rays through and through it, so that they stream beyond. But this opening is not, like the one near Naples, of merely human origin, but must be a freak of Nature herself, and is perhaps due in part to the action of water at an epoch of the remote past when the mountain lay submerged in the surging deep. This power of water we have already commented upon and illustrated in the account we have given of Natural Bridges; and such perforations as those we speak of may be seen at this very moment forming on the coasts of New Zealand, under the action of the tides. But whether this fact explains the perforation through Monte Tafonato is open to question, or rather doubt, for there seems to be little trace of the action of the agent referred to on the rest of the mountain.

XIII.

The Valley of Goldau;

OR, THE FATAL LANDSLIP.

GOLDAU, a town in Switzerland confined within a valley extending south-eastward from Lake Zug to Lake Lowertz, between Mount Rossberg on the north and Mount Rigi on the south, was, along with two neighbouring villages, the scene of one of the most fatal disasters, resulting from landslip, that has occurred in the memory of man. It is fifteen miles or so east of Lucerne, and not very far from the spot where William Tell with his unerring arrow shot the tyrant Gessler. The catastrophe for which it will be long remembered in the annals of misfortune occurred at five o'clock on the evening of the 2nd of September 1806, and it involved the instant and utter destruction of no fewer than 450 human beings. An immense layer of rock, understood, from the cliff-like fracture that still remains to tell the tale, to have been nearly 3 miles long, 1000 feet broad, and 100 feet thick, loosened at length by the previous two

days' rains percolating and washing away, or softening into a greasy condition, the earth that supported it, slid suddenly forward and came rushing down from the high brow of the Rossberg with the

GOLDAU BEFORE THE LANDSLIP.

crash and force of an avalanche tenfold intensified, sweeping the valley from end to end as with the besom of destruction. Churches, houses, huts, with nearly all of living they held within them, were crushed and

whirled away before it, not one stone left upon another; and the lake at the foot of the valley was in great part filled with a wreck of rocks and mud. The waters of the lake were so washed up, in conse-

GOLDAU AFTER THE LANDSLIP.

quence, as to deluge and devastate a village at its further extremity; the earth was subjected to a shock felt across hills and valleys; and the air was darkened far and wide with clouds of dust—at the

sight of which men's hearts failed within them The valley up to that moment was a place of green pastures and ploughed fields, of gardens and orchards, of flocks and herds and happy homesteads; and in less than five minutes the whole lay buried under mounds of mud and fractured rock, in some parts hundreds of feet deep to this hour. And now—from the long deep scar on the brow of the mountain to the slope of the Rigi across the valley—it is a desolate waste of mere ruin, over which the moss and the grass-blade are here and there slowly creeping, to veil, indeed, and clothe it, but where ages shall pass away before its slopes ring as formerly to "the plough-boy's whistle and the milk-maid's song."

Not without warnings did all this sad calamity befall. An old man in the village had long predicted it would happen; and on the very day of its occurrence the mountain itself gave intimations admonitory of the impending doom. "New crevices," says Dr. Zay, an eye-witness, "were observed in the flank of the mountain, a sort of crackling noise was heard internally, stones started out of the ground, detached fragments of rocks rolled down the mountain; and at two o'clock of the day a large rock became loose, and in falling raised a cloud of black dust." Add to this, on the same authority, that the pine-trees on the slopes were seen to reel and ominously droop; the springs dried up and gave no water; and the birds, in their terror, flew away

screaming. Nay, on the stroke of five, when the judgment hour had all but come, the warnings grew louder, and the mountain seemed to know and have pity, for had this last doom's-blast been heeded all might have been saved. Not more than four or five, however, believed the summons and obeyed its trumpet-call. The old man who predicted its advent was quietly smoking his pipe, when one of those who escaped came running past and pointed to the falling mountain. He looked up, observed he had time to fill his pipe yet, and lost his life under the vain delusion that the judgment would wait for him. The young man who warned him, "continuing to fly, was thrown down several times, and escaped with difficulty—looking back, he saw the house of the old man carried off all at once."

A father saved himself by flight, and two of his children. His wife, who was overtaken, was afterwards found crushed to death under a mass of ruins, with her dead infant in her arms; while his servant and a child of five were extricated alive next morning from the rubbish, 1500 feet away from the site of their dwelling. The servant reported afterwards:—"The house (which was of wood) appeared to be torn from its foundation, and spun round and round like a tee-totum. I was sometimes on my head, sometimes on my feet, in total darkness, and violently separated from the child." At length she found herself buried alive, as she imagined, at a great depth, with her head downwards, her body bruised

all over, and wedged in on all sides, so that she could with difficulty at last disengage her right hand and wipe the blood from her face and forehead. Soon she heard several piteous groans, and these she ascertained to proceed from the child intrusted to her, who was buried somewhere near her. To the call of the nurse the child gave answer, that she was jambed in "on her back amid stones and bushes, but could move her hands, and see the light, and even something green." "Will no one come to help me out?" cried she. "No one," replied the nurse dolefully; "it is the judgment-day, and only death will deliver us." And they prayed to God that his messenger, when he came, might carry them to heaven. The sound of first one village-bell, and then another, striking seven, revived the drooping spirit of the nurse, and, calling to the child, she encouraged her with the hope that some one would yet come and save her. The poor little creature then began clamouring for food, until, her voice becoming feebler, she sobbed herself to sleep. The nurse by this time, "still with her head downwards and surrounded with damp earth," experienced a cold and stagnation of circulation in the extremities which drove her nearly frantic, and would have been her death before morning, she protested, had she not by almost preternatural exertions disentangled her limbs. The child resumed her sobbings before day-break, but the father was on the spot with the first streak of dawn, searching agonizingly

for his family. His wife he discovered by a foot which appeared above ground; but she was dead, with her infant clasped in her arms, as we have said The father's quick ear soon recognized the voice of his girl lamenting and calling; and hastening quickly, he extricated her, and by-and-by the nurse also, who was ever after subject to convulsive fits of terror.

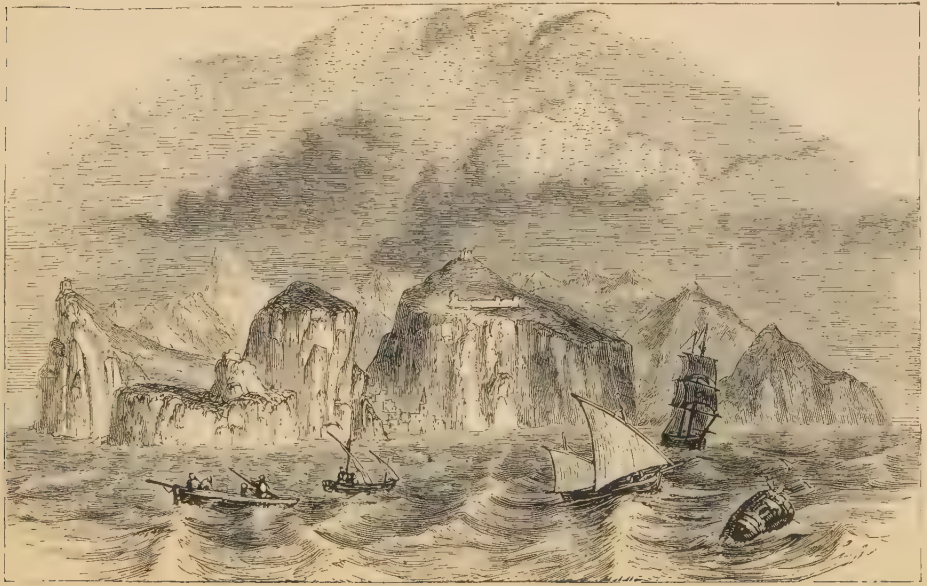
Nor were the villagers the only sufferers in this fearful disaster. A party of eleven tourists from Berne were traversing the valley to ascend the Rigi at the moment of the landslip. Of these, four, who were in the rear, escaped with difficulty, but the rest were swallowed up and swept away; nor, though every effort was made to recover their bodies, has the smallest relic belonging to them ever been found.

"Nothing," says Dr. Zay, "is left of Goldau but the bell which hung in its steeple, and which was found about a mile off." A chapel now stands on the site of this ill-fated village; and here the pious assemble annually on the 2nd of September, to pray to Heaven to avert all similar calamities from themselves and their children for the future.

XIV.

Island of St. Helena.

ST. HELENA connects itself with the rest of the world by two main interests;—as a halting-place for English vessels on their homeward-bound voyage from the East; and as for six years the last, lonely, exiled dwelling-place of the First Napoleon. It is literally one of the far, or rather furthest-off islands of the sea, being 1200 miles from the African Continent, 2000 from America, and 4600 in a straight line southward from London. Rising abruptly out of the ocean, "like a plum-cake upon a table," it is 10½ miles long, 7 miles broad, and 28 miles in circumference, facing the sea in all directions with a wall of perpendicular rock from 600 to 1000 feet in height. This rock, which is throughout volcanic, and of unknown date, rises more perpendicularly on the north than on the south side of the island, and is composed of basaltic precipices of the most fantastic outline, and rent often into fissures from the top to the bottom. Of the inlets by which the island can be approached



ST HELENA.

and a landing effected, there are four, three on the north-west and one on the south-east; and all these are, or were, commanded by forts sufficient to defy even a formidable invasion. No ship can approach it from Europe unless by first sailing past it far to the south and west; and in the days of Napoleon's captivity there was not a nook or cranny on which an invader could, by the faintest possibility, succeed in planting a foot-sole which was not fortified and guarded.

With the exception of two plains, of which the larger is that of Longwood, and contains 1500 acres of fertile land, the island is entirely occupied by a ridge of hills stretching east and west, from which branch off, at right angles, a number of minor ridges, with narrow, mostly verdant valleys between. The highest point of the central chain is towards the east, and called Diana's Peak, 2700 feet; but there are other six or seven peaks along the chain, of which four or five are not 500 feet lower. These hills are in some cases naked to the summit, in others covered with shrubs and trees, especially up the sides. Water of the purest and freshest exists everywhere in rich abundance, and there are said to be no fewer than 160 springs, some of them issuing from the sides of the rocks by tiny picturesque cascades; and spots there are of surpassing beauty here and there, though a lonelier and more dreary hardly exists than that selected by Napoleon for the place of his grave—verdant, indeed, but entirely secluded, and only accessible by one winding path—

where the eye can descry no object except the shifting aspect of the sky above!

Though within the tropics, the heat, except when reflected in still weather from the sides of the bare rock, is never excessive; and indeed of the climate generally, it is said it is never so cold as in England, and scarcely so hot. It is by no means uncongenial to a European constitution, and is in its atmosphere, no less than its supply of fresh provisions, peculiarly adapted for reviving and re-invigorating the exhausted voyager on his way home from the East. The rains, though sometimes impatiently waited for, are in the main regular and abundant, especially in February; and thunder-storms and tornadoes are but seldom witnessed, though it was amidst such Napoleon's spirit passed away. The atmosphere, too, is of such transparency that vessels can be seen at sea to a distance of 60 miles.

When discovered by the Portuguese, in 1502, it was one unbroken forest, without inhabitant. The trees appear to be now all cleared away, and others, native and imported, occupy their place. Some of these are available for their timber, and a number yield an aromatic fragrance when burned. Myrtles grow to a height of 30 feet; a species of fern, with leaves five feet long, grows to the height of 20 feet; and the hills of the interior are covered to profusion with furze, imported from England. The sea breezes here are the great enemy to vegetation; but in the sheltered valleys almost any of the tropical or

European fruits will grow and ripen. The common blackberry, for instance, increased to such an extent after being planted, that in 1780 it had by peremptory order to be extirpated, root and branch; while so prolific is the potato, that three crops are often raised in a single year.

Cattle, principally of English breed, with sheep and poultry, are reared in great numbers, to meet the demands of vessels passing; and goats and rabbits especially swarm plentifully. Sea-fowl of various kinds breed in thousands round the cliffs; game, in the shape of pheasants, partridges, and guinea-fowl, abounds in the preserves; while among the birds of the linnet species there is one here which "builds two nests, in the upper one of which," says Martin, "the male bird sits and serenades the female in her incubation." Fish, too, throng the waters round in such shoals, and take the bait so readily, that the amateur fisher is apt to grow weary catching them.

The population numbers about 10,000, and consists of whites and blacks in nearly equal proportions, the former of whom are remarkable for the wonderful fairness and freshness of their complexions. Those born on the island are of a quick, apt faculty, and a proof in point to show that, as the Greeks believed, the air has something to do with intellect.

St. James's Town, which stands squeezed into a narrow, tortuous valley, between two lofty mountains, at the head of St. James's Bay, and is the only considerable place on the island, has a pleasing, com-

fortable aspect, with its pretty, white, tidy-looking houses, shaded and adorned with trees, generally in full leaf;—no undesirable "man's nest," or habitation, wherein, with a little more activity and scope, the human being wants not for means and appliances. The country immediately to the rear of James's Town is, for the space of two miles, barren and disappointing; but beyond, it opens at once into a region of rich verdure and cultivation, dominated by wooded heights, and enlivened by handsome country residences and villas.

This island has a somewhat singular history of the colonization. Discovered by the Portuguese on St. Helen's day, 21st May 1502, it was not known to the rest of the world, so secret was the discovery of it kept, till Captain Cavendish came across it in the year 1588. It was first colonized by a Portuguese nobleman, who, having for a crime in India been mutilated and shipped home in disgrace, prayed the captain to land and leave him here. This the captain consented to do; and here the nobleman remained, clearing and cultivating the soil, planting the seeds of trees, and rearing the animals his commiserating friends sent him from Europe, till he was removed after four years. This settler was by-and-by succeeded by four slaves, who multiplied erelong into a population of twenty. These, however, threatened, especially if they went on increasing, to consume all the fruits and live-stock on which the ships now depended: and so they were, by orders of the Govern-

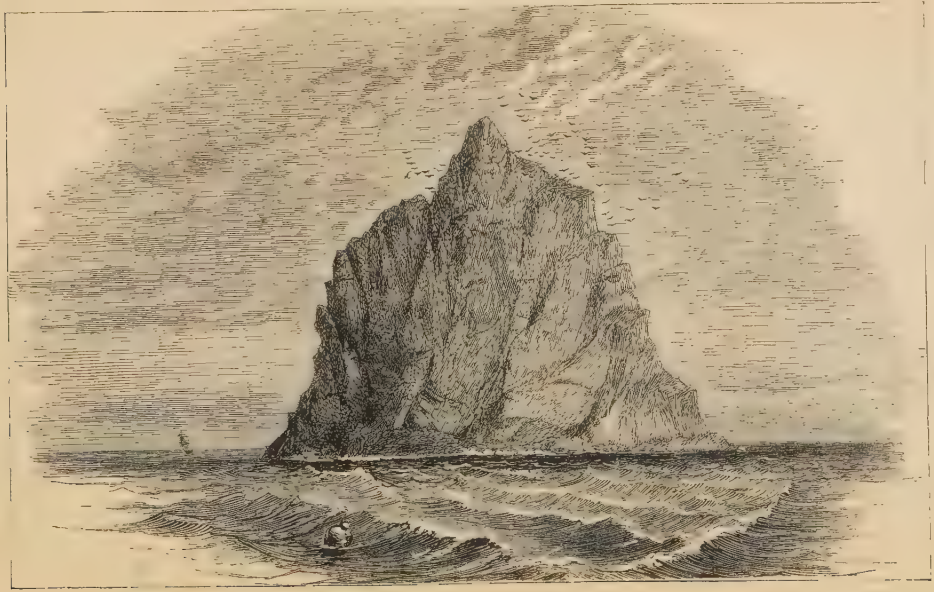
ment, hunted down and destroyed, as if, poor fellow-mortals, they had been only vermin! A friar of the Order of St. Francis, too, tradition says, was once sole tenant of this lonely island: but when we come to inquire into his fate, the accounts are discrepant; for one says he died after a life of austerity of fourteen years' duration; and another, that he was expelled, because he took to roguery, and killed the goats to earn a "comfortable penny" by the sale of their skins; which we cannot help thinking must be an idle, wicked slander, against the good man.

But the island is principally interesting to the rest of the world as the scene of the last days of Napoleon Buonaparte. Here, having surrendered himself into the hands of the British after the defeat of Waterloo in 1815, he lived restricted and in exile; and here, in 1821, he died struggling vainly with his fate.

XV.

Island of St. Kilda.

ST. KILDA, or Hirta, as it was anciently called, is a small, solitary, remote island of the Hebrides, lying in the Gulf Stream, 60 miles from Harris, 140 miles from the mainland of Scotland, and 220 from the north of Ireland, in the latitude of Tain and on the meridian of Cork. It is 3 miles from east to west, 2 miles from north to south; a bold, precipitous mass of rock, ascending to a height of 1500 feet, and visible at a distance of 30 miles. It rises sheer out of the Atlantic by a giddy cliff-like front all round, except at one opening on the south-east and another on the west; and a landing is possible by these only in calm weather, which in this latitude is the exception, not the rule. The bay to the south-east runs inward for nearly half a mile, and only at one point on the north side, at its head, can you, with every furtherance from the natives who crowd to your assistance, bring your vessel safe to and escape ashore. About one quarter of a mile from the head



ST KILDA.

of this iron-bound bay, in a narrow glen, which is the landward extension of it, and overhung by dark precipices, are the houses of the natives, arranged in a double row of some thirty mean flat-roofed cabins of stone, cemented with turf and thatched with straw. These houses consist each of two apartments, one of which is occupied by the family and the other by the cattle in winter, the whole population at the last census amounting to only seventy-eight souls. Isolated enough from the rest of the world and its history, there they live; but not unrelated, for all that, to the thoughts and feelings, hopes and fears, common to all of us.

The island, which rises into four eminences, one of which called Conachan, overhangs the sea on its west side in an almost perpendicular cliff 1400 feet high, the highest in Great Britain, is covered with a black loam five or six inches deep, and this with a rich green sward of fine smooth turf. The sward affords pasture for some 80 or 90 head of cattle and about 1200 sheep; while only a small portion near the village, skilfully, plentifully, and economically manured, is all the natives ever cultivate. This spot, which they reserve for tillage, yields, by favour of soil and climate, generally both an early and abundant harvest, the crops consisting chiefly of barley, oats, and potatoes, and the sole implements of husbandry being the spade and the rake, together with a mallet to pulverize the clods. So well managed was this department of industry at one time in the island,

that the natives were able to export a little and reserve enough; and if it is otherwise now, as the tariff assures us it is, this is because the present generation consumes a greater quantity of farinaceous food than their fathers. Garden husbandry, it seems, is unknown among them. As there are neither trees nor shrubs on the island, there are no fruits; and as the hum of a bee was never heard within its borders, there is no honey. Water there is, of the clearest and purest, welling here and there at all seasons, by accessible outlets and inaccessible; and in one case so cool is it, that by immersing your hand in it for a space, your frame will begin to shiver—though no one that we have heard of has ever thought, as it is alleged the worshippers of Apollo in Greece did in a similar case, of ascribing the shivering to a divinity, and calling it inspiration. The air is sharp and wholesome, and the climate, but for the tempests, which are both frequent and furious, not so severe as might be looked for. The winds, particularly the south-west, and the rains they bring with them, are the enemies the natives most dread and especially guard against; and the sea around is in the main so violent and masterful that they seem not at all at home in it. There is no playing with the waves here as round the islands of the South Seas, where, though both wild and high, they roll landwards over a shelving shore, and you can therefore both ride them safely and dismount from them at will. Here, the waves are the arms of a huge, dumb, unheeding.

unrelenting, hundred-handed monster, dashing the boldest and stoutest swimmer like an idle air-bubble to irremediable ruin upon the rocks. Nevertheless, the St. Kildians are not inexpert fishermen; for of the fish, which are abundant, they catch more than they consume.

There are on the island horses of a diminutive kind, and goats, besides the sheep and cattle we have mentioned. The cows and the ewes are milked, and the milk yielded is mixed and made into a cheese which is in great favour, and taken and sold at Long Island, their only market. The sheep, which have usually a profusion of horn, short tails, and spare coarse fleeces, yield a good mutton, and are available to the natives through the carcasses and wool for both food and raiment, for exportation alive as well, and barter thereby. Besides those on St. Kilda, there are others, amounting to 700 or 800, on two of the five or six rocky islands lying scattered about, and mostly possessed by mere sea-fowl. Of the sheep on one of these rocks, half a mile to westward, Martin, who visited the island more than a century and a half ago, tells us, "each of them has two or three lambs at a birth, and every lamb so fruitful that it brings forth another before itself is a year old."

But the chief dependence of these islanders is upon the sea-birds which swarm here in countless numbers, and the solan goose especially. This bird is in these regions literally the prince of the power of the air,

and monarch of every rock he surveys. Of these, it is said, they succeed in capturing 20,000 yearly, salting and consuming the carcasses, and delivering the feathers to the tax-man of Macleod of Harris, the proprietor, by way of part-rent. They take them from their nests while young, and just before they have wing enough to fly; and this, their chief occupation, is about as hazardous and dangerous as any that falls to the lot of man. Two men set out together, provided with a tough, thirty-fathom rope of cow-hide, plaited threefold, and protected against abrasion by an envelope of similarly wrought sheep-skin; and attaching themselves, the one to the one end of it, and the other to the other, hold on, while now one, now the other, swings himself down the face of a rock overhanging the sea, in quest of nests. This rope is the most prized of all their heirlooms; and a lass whose father is able to give one away with her as her dowry, is equal in the eyes of swains of these parts to an heiress elsewhere of broad lands and proud castles.

The people, though poor, clad in home-spun, and ignorant enough of our civilization and its history, suggest not uninteresting or unedifying thoughts to our meditation. Centuries ago, they were not neglected by the Church of Rome; for here are the ruins of two if not three Roman Catholic churches. Neither have they been uncared for, of late years at any rate, by the Protestant Church, to which ever since the Reformation they have at least nominally

belonged; for they have now a missionary and schoolmaster, who, we hope, are both faithful men. Not long ago, they could neither read nor write; and now, we trust, they can do both, and are wiser and not worse. They are primitive, simple, homely, and virtuous in their ways and thinkings; and, though not quite so cleanly as could be wished, temperate, moderately active, and modest-hearted. They have had, and still have, their trials, like the rest of us. Above a century ago they were nearly all swept away by small-pox, and now three out of every four of their children die on the eighth day. They are of the Celtic race, and show its best qualities within limits—are ardent without avarice and ambition, and affectionate without ferocity. They decide every question of moment to all the community by vote of the majority of their elders, and they live in a commonwealth in which the prosperity of one is hailed as being what it really is, the good of all. Love of country attaches them warmly to the soil of their fathers, and few of them ever exchange it for a settlement on a foreign strand. "Happy land!" exclaims M'Culloch; "if this island is not the Utopia so long sought, where is it to be found? Where is the land which has neither arms, money, law, physic, politics, nor taxes? That land is St. Kilda . . . No tax-gatherer's bill threatens on a church door; the game-laws reach not gannets. Well may the pampered native of the Happy Hirta refuse to change his situation. His slumbers are late, his labours are light, and his

occupation is his amusement, since his sea-fowl constitute at once his food, his luxury, his game, his wealth, and his bed of down. Government he has not, law he feels not, physic he wants not, money he sees not, and war he hears not. His state is his city, and his city his social circle; he has the liberty of his thoughts and actions, and all the world are his equals. If happiness is not a dweller in St. Kilda, where shall it be sought?"

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